MARCH 1972

WEEDS TREES and TURF

EMPHASIS: WEED CONTROL

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AN ENGINE THAT RUNS COOLER BECAUSE IT WORKS WITHOUT SLEEVES.

We're going to show you Ford tractors are *better* by showing you their *differences.*

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The Pesticide Future Is Brighter 10

Arsenicals have long been used by The Green Industry in controlling undesirable vegetation. Cecil F. Kerr, Chipco Turf Products Manager, Rhodia, Incorporated, Chipman Division, in a guest editorial points out the need for these materials and what members of the industry should do to permit the continued use of arsenicals.

Chemicals Reduce Maintenance Costs For Maryland Highways 14

Agricultural chemicals are reducing labor and equipment costs on Maryland highway rights-of-ways. Richard C. Moffett, chief agronomist, Maryland State Highway Administration tells how he implements chemicals into modern ROW maintenance.

Herbicides Keep Jacksonville Drainage Ditches Open 16

Keeping drainage ditches open permits fast run-off of water. Drainage ditches in the Jacksonville area once required much labor and mechanical maintenance. C. C. Holbrook, division Superintendent, Streets and Highways for the City of Jocksonville reports on a new chemical program that keeps vegetation in check.

Chemical Weed Control Cuts Labor Costs In Half 19

Nurseries with weed problems are turning to chemicals as a labor saving device. Many find they can reduce labor costs for hoeing by as much as 50 percent.

Industry's Role In Weed Science 22

Dr. Glenn C. Klingman, director of plant science, Eli Lilly and Company, projects industry's role in weed science for the next quarter century. He comments on the continued need for industry research and undergraduate and graduate university training in the discipline of weed science.

Southern Weed Science Society Report 30

Biological Control For Gypsy Moth 57

Gypsy Moth, directly accountable for the defoliation of more than a million acres of trees last year, can now be controlled with the use of a biological compound called Thuricide HPC. Field trials in Pennsylvania have shown this product to be effective in gypsy moth control.

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The Cover

Modern railroad rights-of-way maintenance includes vegetation control with effective herbicides. Our cover shows a Myers rights-of-way sprayer mounted on a railway car. Chemicals sprayed by this maintenance crew will keep weeds and brush from encroaching on railroad ballast.

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Dacthal®... drives crabgrass and Poa annua off the course.

Dacthal preemergence herbicide drives out over 20 annual grassy and broadleaf invaders, including crabgrass and *Poa annua.* It *prevents* weeds—kills the seeds as they germinate.

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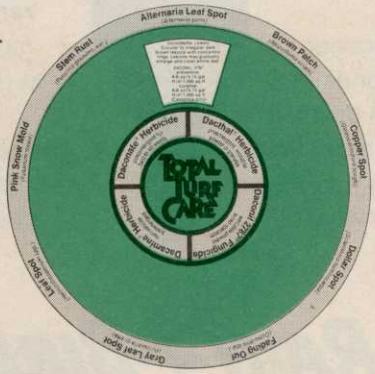

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FREE! WTT-3

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Position_____

Street or PO Box_____

City_____ State_____ Zip_____

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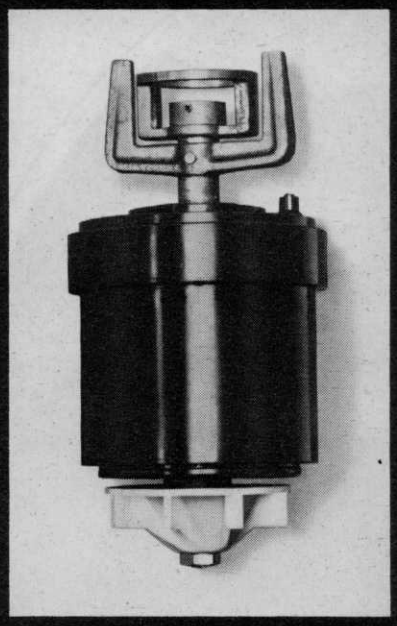
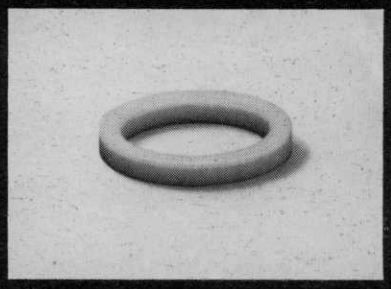


Normal cost of replacement part
for a gear-driven sprinkler:

$13.00 to $47.00



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No wonder we sell more sprinklers.

Rain Bird sprinklers don't know when to quit. That's why the vast majority of millions we've sold since the late Thirties are still going strong.

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The next time you've got a gear-driven sprinkler head up for repair, put it up for replacement instead. With a Rain Bird impulse sprinkler.

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Now "zero-in" on gypsy moth and other tree defoliating worms!

HIGH POTENCY PERFORMANCE Thuricide® bacterial insecticide offers professional tree men a unique and effective weapon in their war against worms. Brings sure death to gypsy moth larvae, spring & fall cankerworm, fall webworm, oak moth larvae, tent caterpillar, red hump caterpillar. Packs more kill power (International Units of Potency) than any other insecticide of its type. Yet Thuricide does not affect man, birds, bees, pets or wildlife!

UNIQUE TARGET ACTION Thuricide's naturally-occurring active ingredient *(Bacillus thuringiensis)* must be eaten to be effective. Even then, it kills only specific target worms by destroying the digestive system. Feeding stops almost immediately after ingestion. So don't worry if you see some worms around after spraying. They're not eating. They're starving to death! There is no toxic risk from drift or residue. And Thuricide will not burn leaves.

PROVED THROUGH USE Thuricide is no johnny-come-lately product. Eight years of use on over 2,000,000 acres of food crops have made it the number one name in biological insect control. Extensive tests on forests, shade trees and ornamentals have proved outstandingly successful. The label lists specific registrations and rates. Write Crop Aid Products, International Minerals & Chemical Corporation, P. O. Box 192, Libertyville, Illinois 60048.

Thuricide®
BACTERIAL INSECTICIDE

Sure . . . Clean . . . Selective!

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Environmental Pesticide Control Bill

The ominous cloud of legislation concerning the Federal Environmental Pesticide Control Bill that hung over the House until early November last year has now moved over the august chambers of the Senate. The 91 Congressmen led by John G. Dow (D-New York) who opposed the Bill to the end are now silently working with their Senate counterparts to breathe more restrictions into the use of pesticides.

Those of us in the Green Industry who communicated with our Representatives and who testified in Washington are well aware that this Bill had more problems than a golf superintendent with a push mower on an 18-hole course. However, we congratulate these people for their effort in turning an unworkable and unrealistic Bill into workable legislation.

But the job is not complete. The bell for round two has sounded. Opponents, Senators Edmund Muskie, Phillip Hart and others, will be leading the fight to win votes from environmentalists who want tougher restrictions on the use of pesticides. Without help, this Bill could set an uncharted course in troubled Senate waters.

We must bring to fruition a law that is workable, a law that restricts but doesn't impede, a law that we can live by. Effort and assurance is still needed by those Senators fighting for just legislation. What can we do? A number of opportunities exist. A letter in triplicate to EPA Administrator, William Ruckelshaus, stating your concern on this issue will help. Testify before the Senate committee, if asked. Band with organizations such as the Southern Weed Science Society in making recommendations to the passage of the Bill.

The debate at this point is not whether the Bill is good or bad. We think that the version that left the House is good for several reasons. One is that better trained industry people will be at the field level—supervising and doing the work. Another is that licensing applicators represents more business for the operator. Lastly, licensing applicators will bring more professionalism to the Green Industry.

The Senate Committee on Agriculture and Forestry is now sifting the Bill through finer screens than most chemicals are sprayed through. The pressure to force the Bill for signature by the President must come from the pump of the Green Industry. Our horsepower as voters and ultimate users of this legislation must be united to get the job done.

BEAUTIFUL

Like beautiful girls, Fylking Kentucky bluegrass lawns offer so much more . . . beautiful color, texture and easy to love and care for. Abundant sideshoots coupled with a thickly branching root system produce an unusually luxuriant turf of thick, cushiony velvet. More disease and weed resistant, drought and traffic tolerant, Fylking has proven superior in 12 years of international tests. It thrives cut at ¾ inch (even low as ½ inch) and makes backyard putting greens practical. Ask for the beautiful one, 0217® Brand Fylking Kentucky bluegrass lawn seed or sod at seed and garden supply centers and sod landscape distributors.

U.S. Plant Patent 2887

Another fine product of Jacklin Seed Co., Inc.

You, too, should be curious about this magnificent young beauty among lawn grasses. 0217® Brand Fylking Kentucky bluegrass is a great green because it greens up earlier in spring, stays green longer in fall. Curiously, Fylking thrives when cut at ¾ inch (even as low as ½ inch) making possible backyard putting greens with no special care required. Its curious name, Fylking, refers to its quality of dense root growth that crowds out weeds. It's a Swedish word because Fylking was discovered in Svalof, Sweden, and developed in America. Internationally tested, Fylking has proven superior over a 12-year period. Fylking is more disease-resistant, produces no seedheads, takes heavy traffic and resists drought. Get curious about this wonderful lawn. It's available as seed or sod at most seed and garden supply centers and sod landscape distributors.

U.S. Plant Patent 2887

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Exciting! Especially in lawn grass! 0217® Brand Fylking Kentucky bluegrass thrives on low cutting. This is the one lawn grass you can cut low enough for a home putting green, yet without special care. Everyone who owns a putter would like a private backyard practice green so they could cut a few strokes off their game!

Fylking has many outstanding attributes. It forms a dense, luxuriant turf that strangles weeds. It's more disease-resistant, takes hard use, resists drought, greens up earlier in spring, stays greener in summer, greener longer into fall. It has been internationally tested more than 12 years and proven superior. Ask for the low-cut beauty in seed or sod. 0217® Brand Fylking Kentucky bluegrass is now at most seed and garden supply centers and sod landscape distributors.

U.S. Plant Patent 2887

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PERFECT!

Right now, we think we have the world's most perfect turf variety (and model). 0217® Brand Fylking Kentucky bluegrass seeds germinate enthusiastically, grow a lush, deep green lawn with a thick turf. And here's where the perfection is appreciated by the people who must grow and care for lawns: Disease and drought resistance! Dense turf crowds out weeds. Fertilizer and water requirements are always modest when cut between ¾ - 1½ inches. (Can be cut low as ½-inch for home putting green.) Next lawn, or to renovate your old lawn, specify the perfect one, 0217® Fylking Kentucky bluegrass, now at most seed and garden supply centers and sod landscape distributors.

Another fine product of Jacklin Seed Co., Inc.

U.S. Plant Patent 2887

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Remember the nam
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years of internation
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Fylking Has Both

First, Fylking is outstanding in performance: beautiful, rich velvet turf so thick it crowds out weeds, is green earlier and later. More disease and drought resistant, can be cut low as ¾ inch, even ½ inch for home putting greens.

Second, Fylking is nationally known. It's becoming one of the most popular, new, low-growing lawn turf varieties in the country. Fylking is advertised nationally in all of the key trade publications and the top daily newspapers. Complete sodding, seeding and technical brochures are provided free on request. For the finest quality turf, insist on 0217® Fylking Kentucky bluegrass, available at your local wholesale distributors.

0217 BRAND

FYLKING KENTUCKY BLUEGRASS

U.S. Plant Patent 2887

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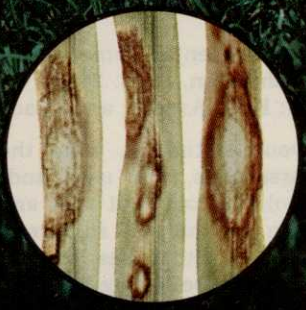
Your first step to healthier turf

1 Spring is the time to take it



Leaf Spot problems caused by overwintering spores of Helminthosporium spp. can spoil the health and beauty of your turf this spring. So can Rust and Rhizoctonia.

But if you apply TERSAN® LSR now, you can break the Helminthosporium spp. cycle before it becomes a costly problem. You stop Leaf Spot before the "melting" or "fading" out stage. And Rust and Rhizoctonia don't get a chance to damage your turf.

The application of TERSAN LSR to tees, greens and fairways in the spring is the first step in the Du Pont TERSAN 1-2-3 Disease Control Program. The program that prevents or controls all major turf diseases on all common grasses throughout the entire year.

The TERSAN 1-2-3 Disease Control Program is effective, economical and entirely non-mercurial. It has been proven by hundreds of professional turf men throughout the country.

For complete details on the program and a supply of TERSAN fungicides, see or call your golf course supplier today.

With any chemical, follow labeling instructions and warnings carefully.

DU PONT TURF PRODUCTS

THE PESTICIDE FUTURE IS BRIGHTER

By CECIL F. KERR
Chipco Turf Products Manager
Rhodia, Incorporated
Chipman Division
New Brunswick, N.J.

Guest Editoral

IN JULY of 1970, the New York State Department of Environmental Conservation issued a list of seventy-two restricted chemicals. The original intent of the new regulation was that these restricted chemicals would be applied only by a custom applicator. In the original document, chlordane could be used only for termite control. Arsenicals were restricted to four pounds of active ingredient per acre. Mercury compounds and DDT were banned completely.

Golf course superintendents had lost most of their valuable, needed tools to maintain beautiful golf courses.

Several superintendents, associations and researchers wrote letters to the New York Commissioner of Environmental Conservation defending tri-calcium arsenate, chlordane and mercurial componnds. Researchers explained the expertise, knowledge and responsibility that professional golf course superintendents possess.

New York changed their recommendations to allow usage of calcium arsenate, lead arsenate and chlordane on turf by permit. The program is sound. Better utilization of chemicals will result from their sensible approach. They have recommended changes for restricted chemicals for 1972 that will allow professional managers' use of restricted chemicals. They have attempted to develop uniformity between requirements of several states and the Federal Government.

Several golf course superintendent associations, leading turf researchers, distributors, over fifty golf course superintendents and the Executive Committee of the Golf Course Superintendents Association of America wrote letters to the Director of Pesticides Regulation Division, Environmental Protection Agency, Washington, D. C. These letters were in defense of the usage of tri-calcium and lead arsenate to control **Poa annua** on greens and fairways. They reported that bent, bluegrass, zoysia, bermuda and fescue grasses are extremely tolerant to arsenical formulations. They presented evidence that phosphates and arsenates are either fixed or absorbed by plants. Both phosphorus and arsenicals remain harmlessly in surface soils. They do not contribute to pollution of lakes and streams.

The Federal Environmental Protection Agency, Office of Science and Technology and USDA Arsenical Review Committees have outstanding scientists as members. We are confident that needed products will be allowed for use by permit for application by professional turf managers.

Dr. Paul Alexander and the Executive Committee of the Golf Course Superintendents Association of America wrote to the Director of Pesticides in Washington supporting arsenicals, stating: "The Golf Course Superintendents Association of of America represents over 2,400 golf course superintendents. We are firmly convinced that these men, because of their educational backgrounds, actual agronomic experience and professional integrity, are extremely well qualified to use the chemical tools which are vital to the growth and management of fine turf."

The members of our association should write to our state and federal agencies expressing their views of pesticide usage. The federal arsenic and lead committees are still evaluating the need for these materials. Write to:

Director, Pesticides Regulation Div.
Environmental Protection Agency
Washington, D. C. 20250
RE: F. R. Arsenic and Lead Notice

In your testimony, state the need for arsenicals, rates used, and weeds controlled. Point out that arsenicals remain on the soil surface and do not leach into lakes and streams. Birds are repelled by arsenicals and do not eat either lead or calcium arsenate. No injury or loss of life has occurred with proper arsenical usage. Request continuance of the wise use of needed tools to manage beautiful golf courses.

The review committees will thoroughly and intelligently examine our testimonies.

for weed free turf

TREX-SAN™

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BROADLEAF HERBICIDE

One TREX-SAN (TM) application in spring, and one in fall will actually control more than 35 different broadleaf weeds, while maximizing chemical safety to turf and ornamentals. TREX-SAN is a unique combination of 2,4-D, MCPP and DICAMBA. The synergism of this three-way combination gives you complete weed control with a cost-in-use that's less than that of most other broadleaf herbicides, when product and labor savings are considered!

TREX-SAN stops BEDSTRAW, BLACKMEDIC, BUCKHORN, BURDOCK, CHICORY, CHICKWEED, CLOVER, DANDELION, DOCK, GROUND IVY, HENBIT, KNOTWEED, PLANTAINS, POISON IVY, POISON OAK, PURSLANE, RAGWEED, SHEEP-SORREL, SHEPHERD'S PURSE, SPEEDWELL, SPURGE, THISTLE, WILD CARROT, WILD GARLIC, WILD LETTUCE, WILD ONION, YARROW and many more!

Order from your Mallinckrodt distributor today!

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MALLINCKRODT CHEMICAL WORKS
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Government News / Business

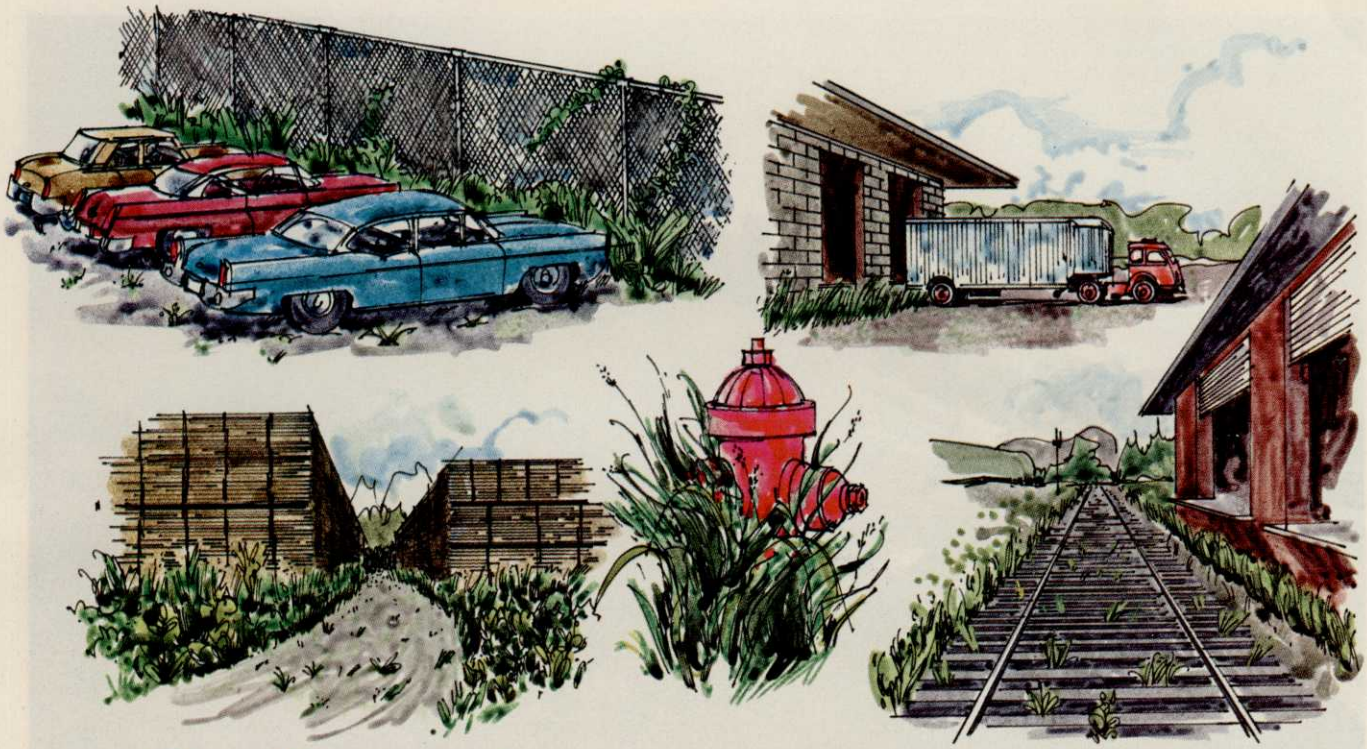
Secretary of Agriculture Earl L. Butz recently announced a technical breakthrough in the control of tree diseases such as Dutch elm disease and wilts of oak and maple. The technique combines a method of making the chemical benomyl, manufactured by the Du Pont Company, more soluble, with a means for rapidly injecting the chemical directly into the tree, rather than through soil. The Secretary said that research conducted by the Forest Service has indicated that this system not only has economic and physical advantages, but could largely avoid the environmental pollution hazards associated with other methods of chemical application.

ICI America Inc. has filed with the Federal Trade Commission a consent order calling for divestiture of company explosives and aerospace divisions within three years. Edward J. Goett, president of ICI America pointed out that the consent order was agreed to for settlement purposes only and is not an admission that any law has been violated. The Order calls for disposal of all properties of the Atlas explosives and aerospace divisions.

Secretary of the Interior Rogers C. B. Morton has designated one of the key persons in each of the five regional offices of the Interior's Fish and Wildlife Service to serve as environmental specialist. Each will be responsible for reporting on major projects that have potential for altering or degrading the environment, including activities such as oil well drilling, mining, highway construction and pesticide applications. Cited the President's Environmental Message of last month which placed heavy emphasis on protection of the Nation's wildlife heritage.

National Safety Council to provide complete information on compliance with the Occupational Safety and Health Act. One communications medium will be the NATIONAL SAFETY NEWS, the Councils's monthly publication. March issue will be devoted to the subject. More than 4 million business establishments and almost 60 million workers are affected by the law. Of 9,300 inspections conducted by the Department of Labor during the first 6 months after the act went into effect, compliance officers determined that only about 20 percent were found to be in full compliance.

Senate committee hearings on the proposed Federal Environmental Pesticide Control Bill begin March 7. Latest change to the legislation will affect farmers and commercial agricultural chemical applicators. A new ammendment now would allow the "certified applicator" (license holder) to control and supervise pesticide use without being physically present at the time. Before, the concern was that every person applying a restricted pesticide would be required to have a license.



Needless maintenance costs are growing all around you!

Eliminate unsightly weeds from your plant site and you'll slash needless operating costs. Weeds increase the rate of equipment deterioration, interfere with work crews, and create fire and safety hazards.

Two effective and economical ways of eliminating weeds are 1. a chemical herbicide program handled by a professional custom applicator or 2. formulated products on a do-it-yourself application plan.

Either way the cost to you is much smaller than hand cutting operations.

Just be sure to specify Du Pont HYVAR® bromacil weed killers. Applied in early spring, a single application of bromacil stops weeds from becoming costly problems throughout the year. You benefit by getting long-term residual control—for a fraction of the cost for mechanical or hand trimming methods.

Starting your program early is important. So call your nearby custom applicator or distributor now and ask for complete details on a Du Pont weed control program.

With any chemical, follow labeling instructions and warnings carefully.

Du Pont weed and brush killers keep fences, storage yards around buildings, and other areas free of unwanted vegetation for months at low cost.

DU PONT
REG. U. S. PAT. OFF.

INDUSTRIAL HERBICIDES

HYVAR® X bromacil weed killer
HYVAR® X-L bromacil weed killer
AMMATE® X weed and brush killer

For More Details Circle (134) on Reply Card

Early spraying with agricultural chemicals on highway rights-of-ways can reduce maintenance costs later in the year. Here, maleic hydrazide, a growth regulator, is being sprayed on slopes to reduce vegetative growth. Highway crews find chemicals eliminate much tedious work.

Chemicals Reduce Maintenance Costs For Maryland Highways

REDUCED maintenance costs on expanding highway rights-of-ways are becoming a reality through the substitution of agricultural chemicals for costly labor. With the rapid expansion of today's modern highway systems, maintenance engineers and others are constantly looking for new ideas and ways to economize.

While mowing remains a principal method of highway vegetation management, highway engineers find that integrating chemicals into the maintenance plan often brings a better return on the maintenance dollar.

This is proving to be true with the Maryland State Highway Administration. Modern concepts in land management of ROW are being implemented thanks to the progressive thinking of the Bureau of Landscape Architecture headed by Charles R. Anderson, Bureau Chief and Richard C. Moffett, chief agronomist. He and Donald B. Cober, agronomist, have developed and incorporated the use of chemicals into the maintenance plans of the state's seven districts encompassing nearly 5,200 miles of ROW.

"We don't advocate the use of any chemical unless it actually improves the appearance of the highway," says Moffett. "Agricultural chemicals are used to achieve economies in roadside maintenance. If we spray weeds and brush or make an application of a growth regulator, it is done to lower cost, increase safety and modernize an existing method of maintenance, either hand or mechanical."

Moffett's other reasons for using agricultural chemicals are indicative of his training in weed science and agronomy. "It is not necessary today to maintain all the highway acreage with mowing machines. Some of these areas can be eliminated from a regular maintenance schedule," he says. Areas that can have a reduced standard of maintenance are left to return to the vegetation of the adjacent area. Certain areas might be more pleasing to the passing motorist if they are permitted to return to the natural vegetation, thus eliminating work for a labor force.

One of the first jobs that Moffett tackled in selling the concept of chemical vegetation control was select and train applicators. Few, if any, men had knowledge of chemicals. Most were equipment operators or on the promotional list for road foremen. Of these, Moffett picked those who were interested in advancing themselves and willing to enter a challenging new field.

"We started with fellows familiar with agricultural practices and trained them in equipment," he says. "But that didn't work out well. Now we take equipment operators and teach them about vegetation control with chemicals."

He brings these people in and conducts classes. "These men are taught to think," says Dick Moffett.

"I tell them that they are an elite group. They must know at all times

(continued on page 28)

Ag-Organics Department, Midland, Michigan 48640

Dursban insecticide. Bugs have another name for it.

They call it "The Unsurvivable One!" Because nothing wipes out chinch bugs, sod webworms and many other serious turf pests like DURSBAN* insecticide. And DURSBAN insecticide won't leach. It has excellent residual activity. It's safe, too, for all common turf grasses. And economical—you get more bugs for your buck, because so little goes a long long way. Ask your Dow distributor or your contract applicator for "The Unsurvivable One!"

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DOW CHEMICAL U.S.A.

Herbicides Keep Jacksonville Drainage Ditches Open

By C. C. HOLBROOK
Division Superintendent, Streets & Highways
City of Jacksonville, Florida

IMPROVED maintenance of over over 4000 miles of drainage ditches with no increase in cost to the taxpayer has been the objective of a new weed control program initiated a year and a half ago by the City of Jacksonville. Now with two growing seasons behind us on our new program, we know we can accomplish this goal, without any increase in our manpower requirements.

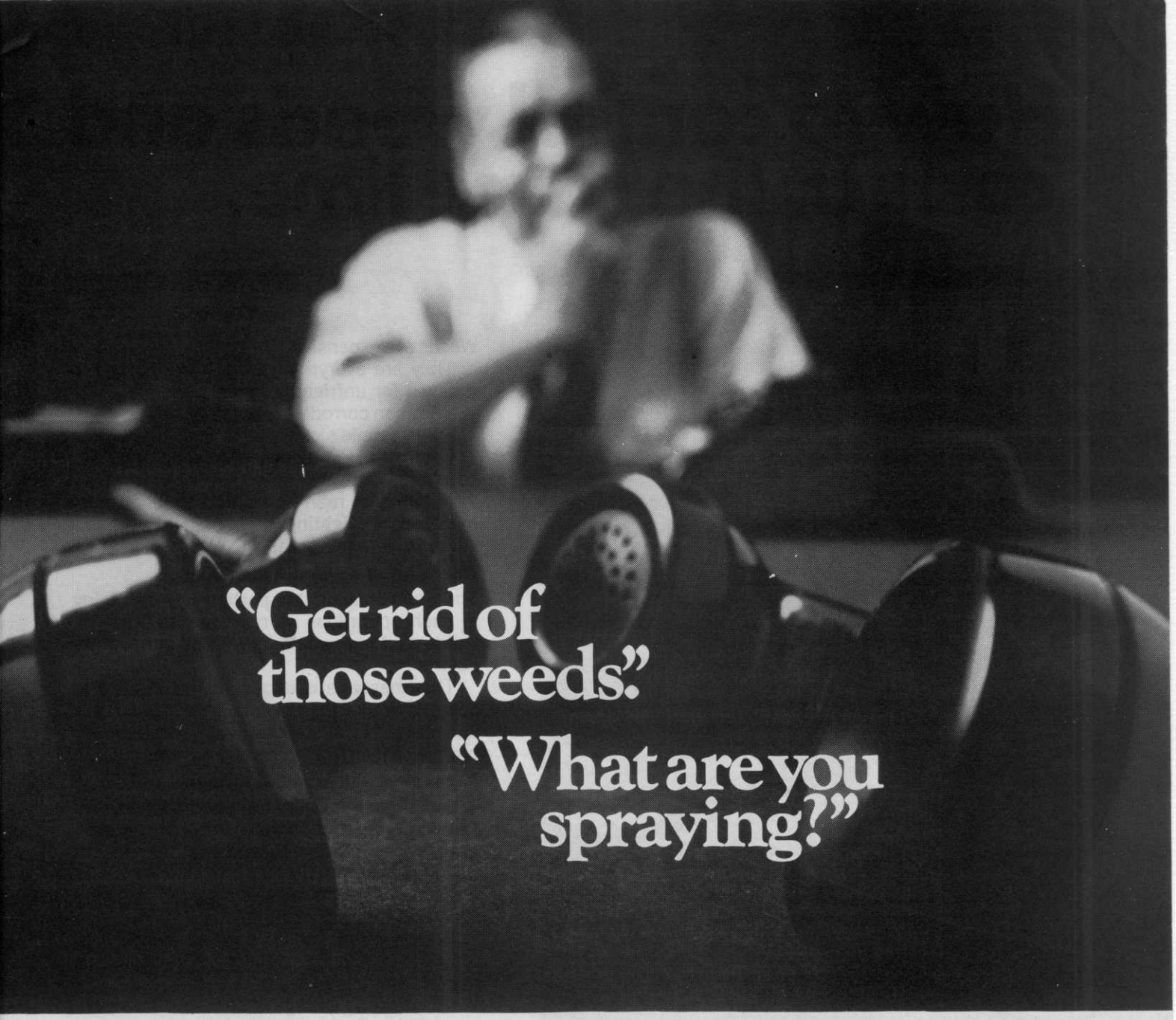
It has not been a case of getting our men to work harder; it's really been a case of upgrading manpower skills and teaching our crews to be more effective, And the new ingredient we have introduced is the concept of safe chemical weed and brush control. Our basic material used to date has been Ammate X weed killer — a safe compound that can be applied to growing vegetation for seven or eight months out of the year in our area.

Where once we depended almost entirely on mechanical cutting or hand trimming of weeds and brush in our drainage ditches, now we have successfully switched to chemicals as a prime tool for keeping the ditches free of dense growth. This growth has always been a problem for us. It contributes to flooding in wet, rainy weather, it harbors pests, rodents and snakes almost all year round. But we have learned that chemical weed and brush control can open a new dimension for us in economic ditch maintenance.

Jacksonville is recognized as the largest city in the U.S. with 850 square miles inside the city limits. A number of factors, aside from size, tend to complicate normal surface drainage problems. On the one hand, we have heavy annual rainfall — more than 53 inches in an average year — and at least part of this is likely to come in severe tropical storms. We have an unusualy long growing season — the active period is about ten months. We have a high water table and essentially flat terrain. As a consequence the city has developed an extensive system of drainage ditches to prevent flooding and damage to grounds, buildings and household goods. Without the ditches, water damage would run into the millions of dollars — even in a moderately heavy storm.

(continued on page 42)

Clean main ditch has been kept free of brush by application of Ammate X two months after dragline operation. The ditch bottom, slopes and berm were sprayed. Dead vegetation has been removed allowing good water flow. Mowing will permit grasses to thrive on slopes and berms.



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It's tough being the man in the middle when you're armed only with excuses.

Geigy herbicides give you something better. Answers.

Answers to all kinds of weed and vegetation management problems.

Answers that should satisfy both sides: Those concerned about stopping weed pollution, and those concerned about what you're spraying.

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You've got AAtrex®, Princep®, Atratol® and Pramitol® to choose from. In wettable powder, emulsifiable, pelleted and granular forms. Each is suitable for various jobs and conditions. But all give long-term, effective performance. Singly or as the foundation for combinations of chemicals.

So if you'd like help in planning a vegetation management program that gives you answers, not excuses, please send this coupon to: The Industrial Weed Control Department, Geigy Agricultural Chemicals, Division of CIBA-GEIGY Corporation, Saw Mill River Road, Ardsley, New York 10502.

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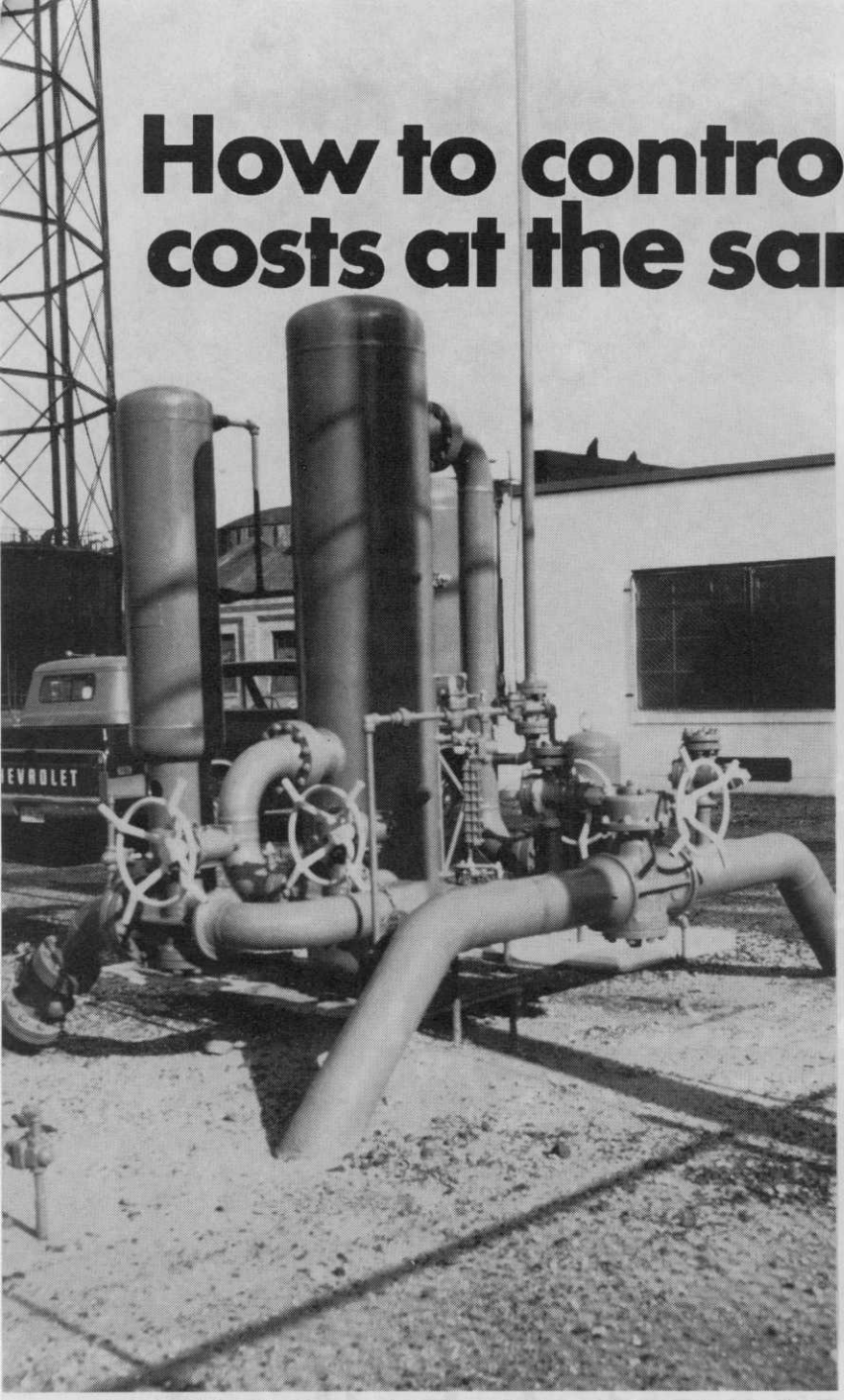
How to control weeds and costs at the same time.



In industrial applications, as shown here, Tandex controls weeds along fence lines, parking areas, ditches, pipelines, sidings, storage areas, tank farms, and sign posts.

Weeds are expensive.

They are everything from a fire hazard to a haven for unfriendly rodents.

They can corrode a fence line.

Make people sick.

Destroy the drainage efficiency of a railroad's right-of-way.

Millions of man-hours and thousands of machines are fighting the war against weeds.

A very expensive war.

Weeds hit some harder than others

The weed onslaught is particularly damaging to such operations as railroads, utilities, oil fields and highways, as well as general industry.

This message is especially addressed to operations like these—it is a message about Tandex®, the soil sterilant that can drastically cut the cost of weed control programs.

Tandex—what it is and what it does:

Tandex is a urea-carbamate compound that's demonstrated exceptional control over weeds, grasses, vines, brush and the hard-to-kill woody species.

Tandex does its weed-killing job by being absorbed through plant roots.

Once applied, Tandex can last a whole season, or longer. Yet it's relatively non-hazardous to man, animals or fish.

A distinct advantage of Tandex is its stability in the soil. Put another way, this means it has minimum lateral movement—which reduces the danger to nearby trees and shrubs you *don't* want to lose.

Tandex can be sprayed or applied in dry granular form. It can also be combined with other herbicides for special control situations.

For more information, write to Industrial Chemicals Dept., Niagara Chemical Division, FMC Corporation, Middleport, New York 14105.

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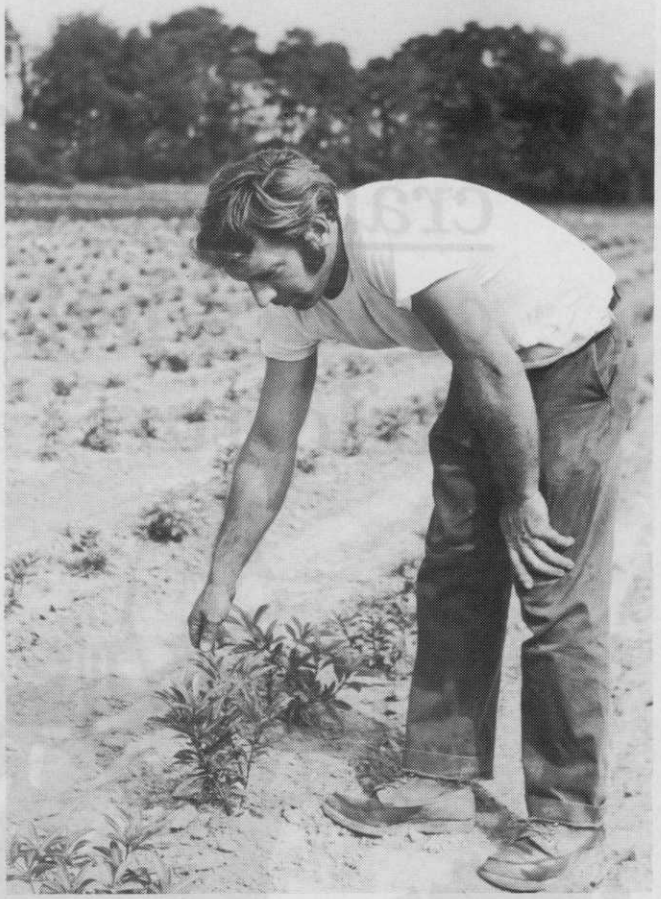
Chemical Weed Control Cuts Labor Costs In Half



Fred Platt, manager of the Robert W. Baker Nursery at Simsbury, Conn., examines a plot in one of the fields that makes up the 300 acres nursery. He used Princep and Enide plus cultivation for weed control.

MANY NURSERIES have reduced their labor costs by 50 percent—or more — with chemical weed control. It's the no-hoe way to go.

That's the story at the Robert W. Baker Nursery, near Simsbury, Connecticut. Fred Platt, who's manager there, states that before making the switch to herbicides he had men hoeing around the junipers, yews, and pines on the nursery's 200 acres.

"Last year we had 30 men doing the hoeing and other field work. This year we have 13. We've cut costs more than half with chemical weed control," Platt says.

Thanks to modern herbicides, he had a field that needed no hoeing this past summer, while another field required only one light hoeing by 10 men in about two hours. Yet, Platt still believes in cultivation for new and established fields.

With labor and other operating costs rising, nurserymen like Fred Platt have turned to herbicides as a less expensive, more convenient method of weed control — and one that is less injurious to nursery stock than the usual hand mechanical methods.

Platt has been using such chemicals as Eptam, Princep, Treflan and Enide. At the Baker-owned Atlantic Tree Service nearby, Princep and paraquat are used to control weeds between the 10 ft. rows of several varieties of large shade trees.

"We've used Princep for five years, and the only problems we've experienced were the result of our own mistakes — improper calibration of equipment or miscalculation of the weather. It does a great job of keeping broadleaf weeds out, and we don't put it on heavy," Platt explained. He goes light on application to insure against plant injury.

At the Baker Nursery they use about two tons of the granular chemical and 100 pounds of the wettable powder a year. "We're getting great results with the granules. If you get them on at the right time, they work," he said.

Platt has gone to fall applications because spring land conditions often hinder field work. An application of a combination of two herbicides last November led to the no-hoe condition on one field of established nursery stock.

"If I continue to get such results this next year, we won't apply in the spring except for new fields," Platt said. The granules need moisture to break them down, so Platt sometimes applies over snow and gets good weed control, where a summer application without rain "is useless."

Dr. John Ahrens, of the Connecticut Agricultural Experiment Station, Windsor, sees a greater shift to fall applications with little spring use of the herbicides.

"Several herbicides or herbicide combinations can be safely applied in the fall to control weeds in nur-

(continued on page 26)

BANDANE® crabgrass control helps build turf

Equally important, Bandane does not injure your established turf or disturb other grass stands. Extensive tests and years of experience by homeowners and institutions have proved the high, selective, pre-emergence efficiency of Bandane on lawns without thinning the turf or inhibiting rhizome development. This allows turf to thicken and develop its own built-in crabgrass resistance.

Bandane is the only pre-emergence crabgrass chemical (within the same performance range) that may safely be applied to established turf at the *same time* as over seeding.

You don't have to add a soil insecticide when you use Bandane. Bandane controls the common soil insects that normally weaken turf. Nor do you need to be overly concerned about skin irritation or injury to animals or humans. Bandane has a very low mammalian toxicity rating.

Bandane comes in 50-lb. bags of 15% granules. It can be applied with any standard granular application equipment.

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If 2,4-D "tolerant" broadleaf weeds (such as red sorrel, carpetweed, knotweed, chickweed, clover, etc.) are your major problems, seriously consider Banvel 4-S because it was developed specifically to control these tough ones. Banvel enters weeds through leaves, stems *and* roots, and then "translocates" throughout the plant, destroying from root-tip to leaf-tip.

If you have more general broadleaf weed problems, including dandelion, plantain, knawel, ragweed, pigweed, burdock, poison oak, poison ivy, wild garlic, wild onion, etc., Banvel + 2,4-D gives you the best of two control methods in completely compatible and water soluble form.

Explicit directions about weeds controlled, timing, and rates of application appear on the package labels. Ask your supplier for full information about these outstanding time- and money-saving chemicals, or write to Velsicol Chemical Corporation at address shown below.

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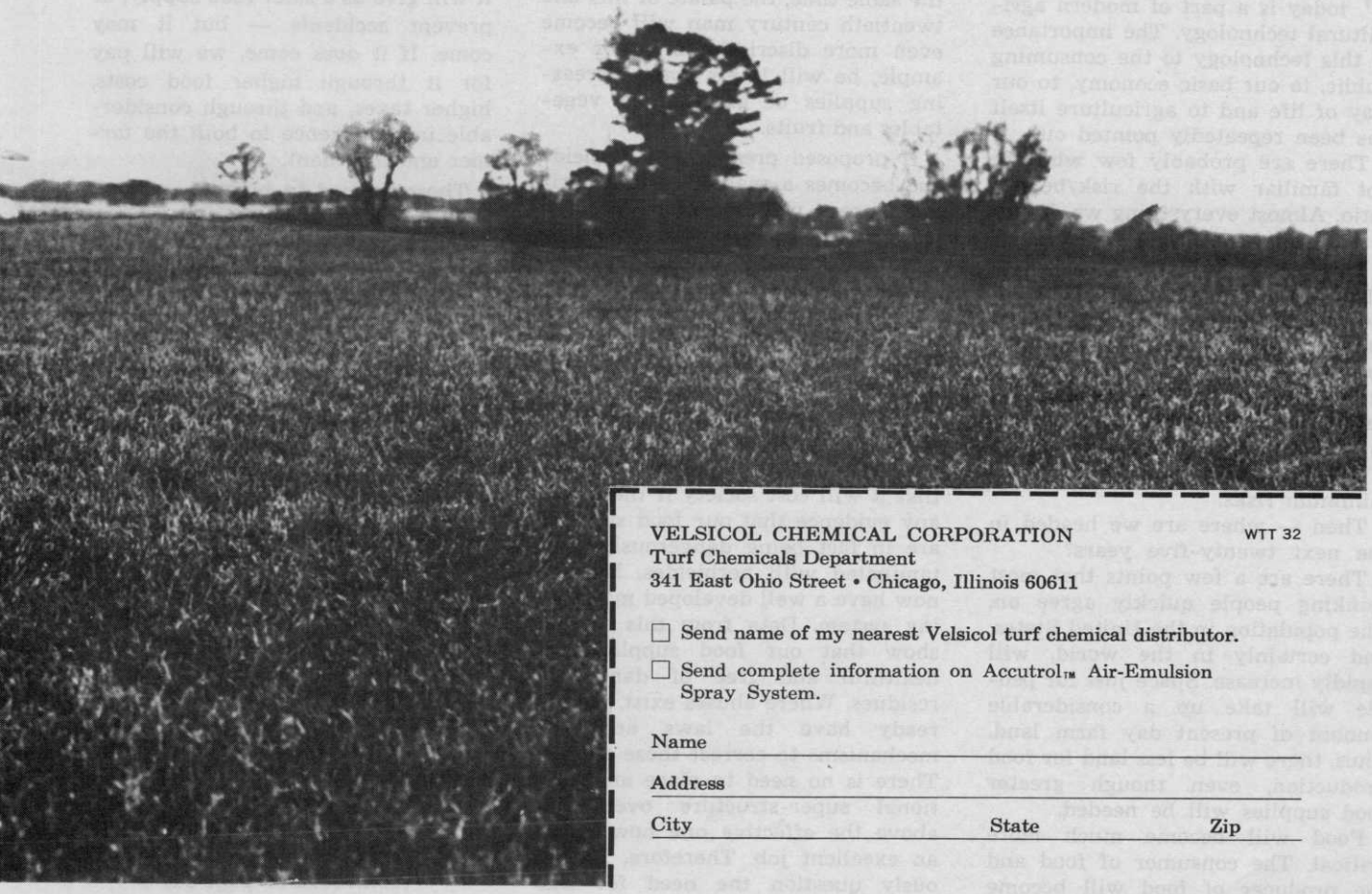

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Industry's Role In Weed Science

Dr. Klingman has served as President of the Weed Science Society of America and the Southern Weed Science Society. He recently retired from North Carolina State University where he was active in teaching and weed control research. He has authored several books on weed control.

By Dr. GLENN C. KLINGMAN
Director of Plant Science
Eli Lilly and Company
Greenfield, Indiana

WEED CONTROL as we know it today is a part of modern agricultural technology. The importance of this technology to the consuming public, to our basic economy, to our way of life and to agriculture itself has been repeatedly pointed out.

There are probably few who are not familiar with the risk/benefit ratio. Almost every thing we do has a risk/benefit attached to it.

Those of us that have worked in agriculture are convinced that in modern herbicide development the risks are very low compared to the benefits. The fact that in the United States we are enjoying a brief period in history when our ability to produce food exceeds our needs is due to our acceptance of these minimum risks.

Then — where are we headed in the next twenty-five years?

There are a few points that most thinking people quickly agree on. The population in the United States, and certainly in the world, will rapidly increase. Space just for people will take up a considerable amount of present day farm land. Thus, there will be less land for food production, even though greater food supplies will be needed.

Food will become much more critical. The consumer of food and the producer of food will become even more distantly separated. At the same time, the palate of this late twentieth century man will become even more discriminating. For example, he will likely want increasing supplies of green leafy vegetables and fruits.

If proposed prescription pesticide use becomes a reality, certain agribusinesses will develop rapidly. Custom service may take a number of forms. Probably the first will be greatly increased custom application. We can also expect the organization of professional service groups providing technical advice and recommendations, and assistance to the farmer in meeting requirements.

I would agree with these proposed new regulations and the millions that it will cost society if there was any evidence that our food supplies are in fact being dangerously contaminated with herbicides. But we now have a well developed monitoring system. Data from this system show that our food supplies are healthful and free of dangerous residues. Where abuses exist, we already have the laws and the mechanisms to correct those abuses. There is no need to place an additional super-structure over and above the effective one now doing an excellent job. Therefore, I seriously question the need for this pesticide regulation. I question that it will give us a safer food supply, or prevent accidents — but it may come. If it does come, we will pay for it through higher food costs, higher taxes, and through considerable inconvenience to both the farmer and merchant.

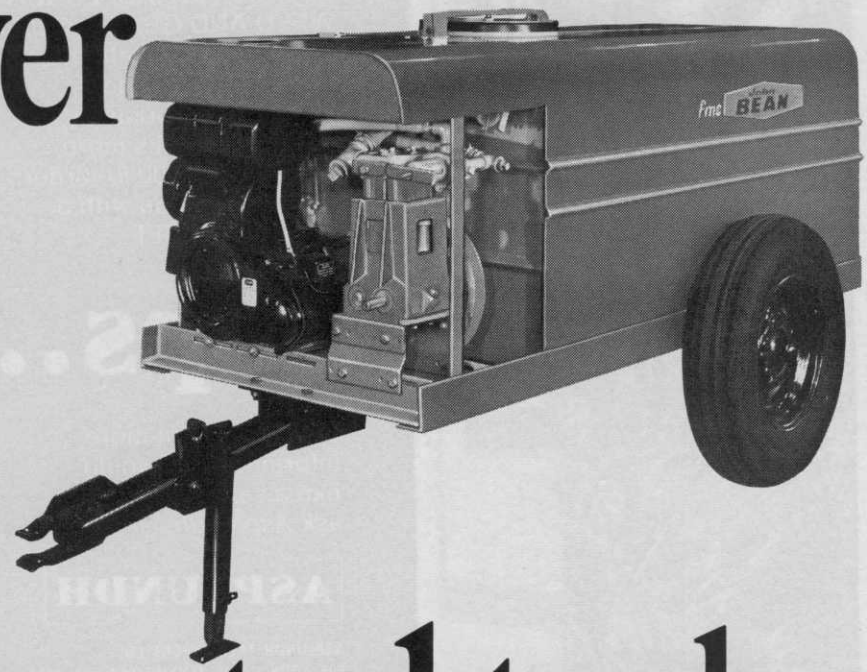
Those trained in biology are well acquainted with "survival of the fittest." Only within the past hundred years has there been adequate food plus developments in medicine to permit rapid increases in the human population. Through history whenever too many people or too many animals developed in a given area, nature quickly acted through famine or disease to bring about the needed balance. It was truly a survival of the fittest.

We should remember that those biological laws have not been repealed. Technology has simply made it possible for most of us to temporarily escape the full force of these biological laws.

The risk/benefit ratio of technology has certainly been in man's favor. I would hope that more ecologists recognize that herbicides can be used to manage the environment to the advantage of wildlife, birds, fish — and, thus, can be a friend to

(continued on page 24)

more dependable than ever



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So, if you want more information or would like a sample, just . . . *ask Asplundh.*

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INDUSTRY'S ROLE *(from page 22)*

these species — just as they are a friend of man.

Let us consider weed science as we know it through education and research — and the effects that industry may have in the future.

The need for weed science education will increase during the next twenty-five years. Much of the confusion concerning pesticides and agricultural chemicals has total misunderstanding as its roots. Frequently, critics do not even understand elementary chemistry, elementary plant physiology and elementary ecology as it relates to agricultural production. The answer appears obvious. We must have better education in these areas.

Modern entomology and plant pathology are less than fifty years old, and modern weed science is less than twenty-five years old. Only a handful of college of agriculture graduates have had any real training in weed science. Less than ten percent of our college of agriculture graduates have had a single course in weed science. The public has had almost no education in the subject.

More and more, I hear comments that industry must do more toward education in weed science. I readily admit that more education is needed. Industry may produce movies, slide sets, circulars, etc. thereby helping some.

However, education, per se, is not the job of industry. Industry education will remain product oriented — to gain more widespread and better use of their products.

Undergraduate and graduate university training is the cornerstone to better understanding and a better informed public. Others from industry that have supported increased university training in weed science include Dr. Hannah of Monsanto, Dr. Wolf of E. I. duPont, Mr. Adolfi of Geigy, Mr. Mullison of Dow, Dr. Fertig of Amchem, and others. Let's keep our thinking clear. Universities are for teaching and research. The challenge cannot and will not be adequately met by industry.

In education areas, probably the greatest overlap occurs in the marketing and sales area of industry and that of university extension. Both are working toward the adoption of new, and assumed to be, improved practices. Both appeal to the same motives and senses. Having now worked reasonably close to both, I would say that there is almost no difference in personality, and capabilities of a good university extension worker and a really good industry salesman.

Dr. Don Davis of Auburn University and Dr. Larry Hannah of the Monsanto Company have alluded to the fact that the farmer is placing less and less emphasis on experiment station recommendations when he decides what herbicide to use. It would appear to me that this same trend has continued through the past five years. I would guess, however, that this varies from state to state, depending upon the adequacy of research data and the soundness of recommendations coming from the experiment station and extension service of the state.

I still maintain the view that research, including field research, should be done by the State Agricultural Experiment Station. Also I feel equally strong that the original concept of adult education, probably through demonstration, is an appro-

(continued on page 38)

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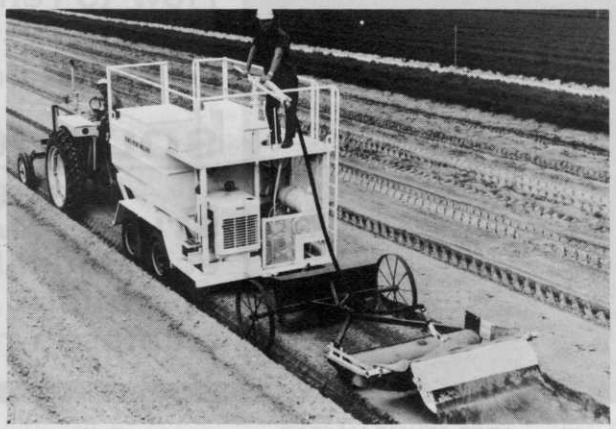

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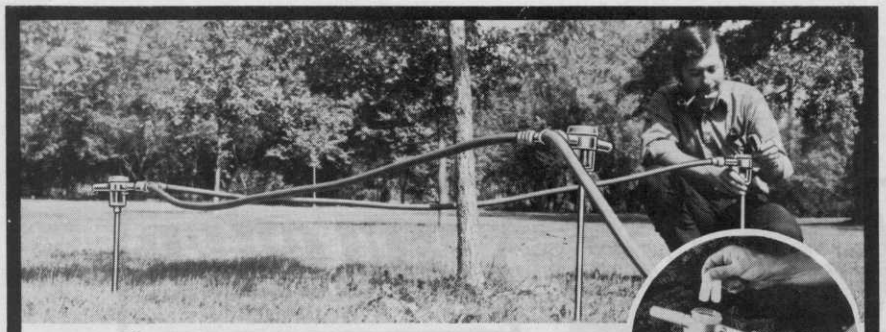

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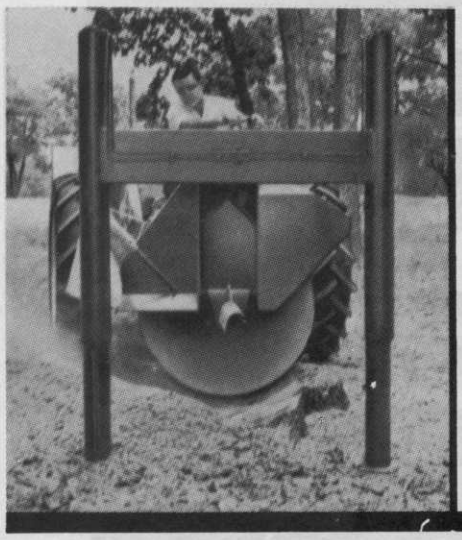

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WEED CONTROL *(from page 19)*

series until June or later," says Ahrens. "In the Northeast, fall or winter applications do not usually affect the growing of an oat cover crop the following September, an added advantage where winter erosion is a problem."

The researcher reports of an experimental simazine-trifluralin (Princep-Treflan) combination applied in the fall with "terrific results." He feels that combinations give the best utility, because one chemical will kill weeds not affected by the other. The granular forms "remain a very effective herbicide for fall use," while simazine wettable powder in spring controls weeds such as established chickweed.

"Nurserymen like granular herbicides because many are not equipped for spraying weed control chemicals. But no two nurseries are exactly alike in size and in what they grow, so both forms — granular and wettable powder — can be adapted to their needs and available equipment," Ahrens says.

For instance, the D. Hill Nursery at Dundee, Ill., uses a Hahn Hi-Boy sprayer and another 50-gallon sprayer for chemical weed control on its 750 acres.

Bill Kreutzfeld, vice-president in charge of production, says their weed control program is designed to give both lower production costs and better plant development.

Visitors to the Midwest Nursery and Landscape Expo held at the Hill Nursery in late July, 1971, were told, that the 'ideal' procedure calls for early land preparation. Quick Start liners or others are planted in alternate 44-inch beds, with plants on 11-inch centers. Princep is applied and followed immediately by 1½ inches of irrigation.

The irrigation activates the chemical in the top 1½ inches of soil. Kreutzfeld explained, "The application is done after the first cultivation in the spring, which is immediately after planting."

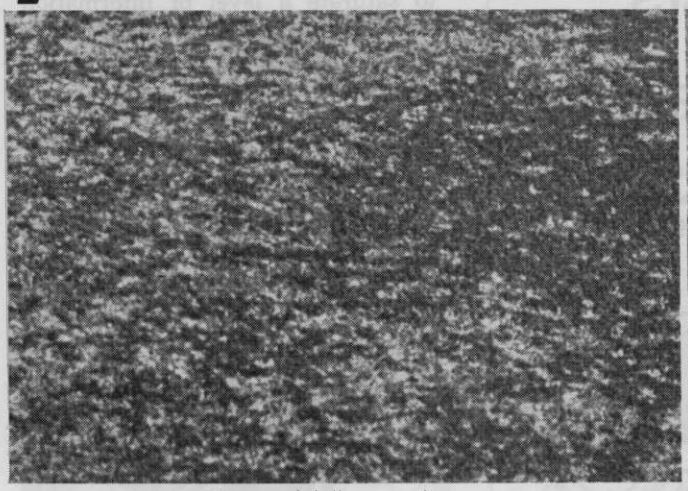
He believes his rate of four pounds an acre may be more than is needed, but bindweed is still a problem weed for them. Hill Nursery has used the herbicide since 1956 and rates it as a "genuine benefit." But they also recognize the necessity of using it carefully.

Frank Kogut, Jr., manager of the 300-acre Kogut Nursery in Meriden, Conn., puts in many busy days supervising fieldwork and other activities.

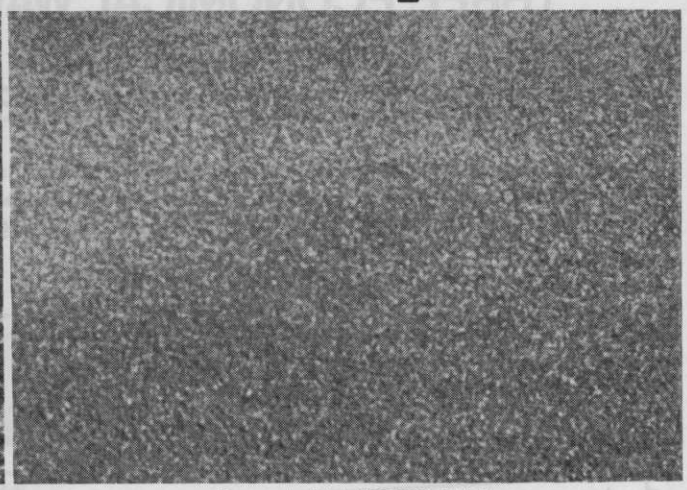
His main concern is spring weeds

(continued on page 54)

When dollar spot hits, here's how new systemic MERTECT® 140-F flowable saves your turf, time, and money.



Untreated dollar spot disease



Treated with MERTECT 140-F

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And with its special advantages, MERTECT 140-F makes the performance picture look even better.

Being flowable, it saves you time in measuring and mixing. Handling is safer. Dispersion is more complete, so you get the right mixture for more effective results.

Since MERTECT 140-F is systemic, you also get away with fewer applications per season, thanks to its residual disease control. And it has a lower dosage rate than other fungicides, so you save there, too.

Just follow the label instructions. MERTECT 140-F is not phytotoxic to grasses when used as directed. Your Merck distributor has new flowable MERTECT 140-F now. If you don't have his name, write us. Agricultural Products, Merck Chemical Division, Merck & Co., Inc., Rahway, N.J. 07065.

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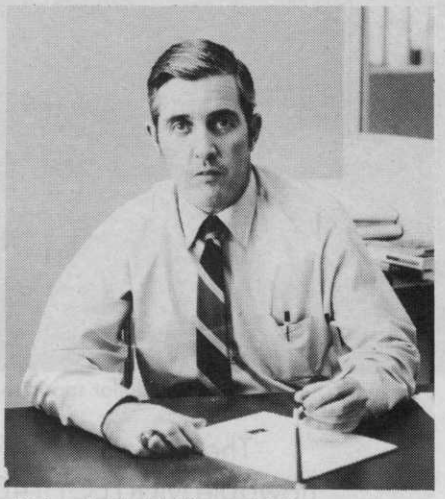
CHEMICALS *(from page 14)*
what they are doing. They must have a thorough knowledge of herbicides and they must be able to establish a report with the public and highway personnel." The objective is to teach each man as much as he is capable of learning.

The program as it is now set up calls for a two year apprenticeship — before a man is qualified to apply herbicides. During the two years the men become familiar with the basic principles of weed and brush control, traffic conditions, mixing and handling chemicals, and maintaining application equipment. Each man is then assigned equipment of his own which he is required to maintain. They are currently using primarily Myers sprayers designed for highway use.

Moffett contends that projecting the use of chemicals into a maintenance plan must be a carefully coordinated effort. Chemical application can accomplish one thing while mechanical mowing can do another, he says. Their interaction must be complimentary.

"We had to sell the idea of herbicides and plant growth regulators to various people in the districts," recalls Don Cober. "We had to learn who to contact. The key man in a district might be sold but if the man on the mower wasn't convinced, the program in that area would not be effective. We had to coordinate the actions of the district and our suggestions on the use of chemicals so they would be one. This involved winning the confidence of key people.

"We had to set goals. If it's to educate, you don't have to see many people. If it's to get the material on the ground, then you have to get out there. Originally our objective was to saturate a level of information about chemicals at a personnel level that you expect would go down the



Richard C. Moffett, chief agronomist, Bureau of Landscape Architecture, Maryland State Highway Administration.

line; however, that didn't always get the material on the ground," he says. "As a result, I had to become a partial applicator in addition to salesman, supervisor and advisor."

In addition to the spray equipment assigned to the districts, the Roads Commission has two large capacity sprayers. One is a Myers air carrier unit developed for railroad ROW spraying. It is skid mounted with a 1000 gallon rust-proof tank. A two stage centrifugal pump capable of producing 100 gpm at 190 psi delivers material to eight broadcast nozzles and a 29 inch air carrier machine. It has the capacity of spraying material 40 to 50 feet from the road shoulder. Moffett uses this sprayer to apply maleic hydrazide, a turf growth regulator.

The second spraying unit is a redesigned 450 gallon off-the-road

(continued on page 40)

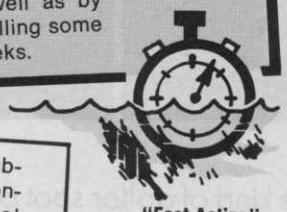
THREE ECONOMICAL WAYS TO CONTROL WATER WEEDS AND/OR ALGAE

Depending on your specific requirement, Pennwalt makes available three different chemicals to rid lakes, ponds, streams or drainage canals of unsightly and often costly aquatic weeds or algae.

Select the aquatic herbicide to meet your needs . . .

Aquathol-Plus® kills 24 different submerged, emerged, or floating weeds by systematic action as well as by contact. Aquathol-Plus goes to work at once, killing some weeds right away while others die in 2 to 4 weeks.

Aquathol K® kills 15 of the most common submerged water weeds by direct contact. Weed control is achieved within 7 days under normal conditions.



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Hydrothol® is a wide-spectrum algaecide—and herbicide — effective against chara and many algae that cause problems in lakes and ponds as well as drainage canals.

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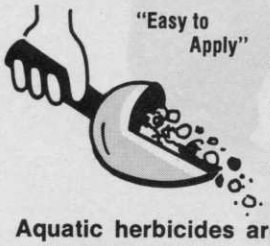

"Easy to Apply"

Pennwalt aquatic-weed and algae control chemicals are available in both liquid and granular formulations. The liquids may be applied direct from the container or diluted with water — either as a surface spray or injected under the water. Granular products can be applied by air, with various types of mechanical spreaders, or broadcast by hand scoop.

Aquatic herbicides are the most effective, economical, and generally, the easiest method for controlling unwanted weeds and algae. Ask your nearest Pennwalt Representative for more information to solve your specific aquatic weed problem.

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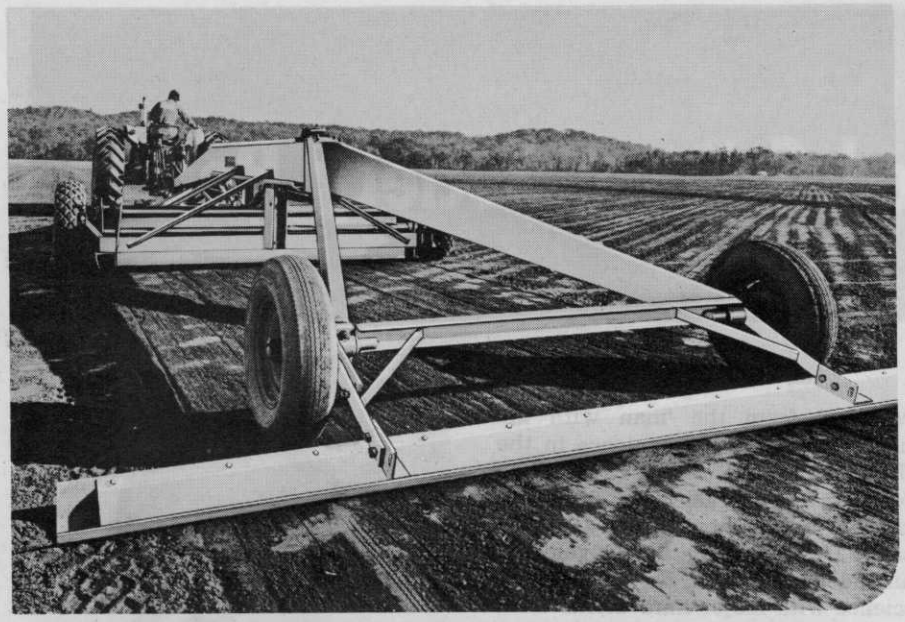

Table Top Surfaces

Leading sod farmers are using Eversman Automatic Land Levelers to make smooth, uniform seedbeds.

Also for golf courses, cemeteries, landscape architects.

Eversman Smoothers combine in one machine a field plane, open bottom scraper and a complete tillage tool for superior seedbed preparation. Smooth, level fields make possible even seeding, uniform germination with uniform turf maturity and faster, precision harvesting on fields that are easy on equipment.

The exclusive EVERSMAN Crank Axle.

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The leveler's main wheels are placed outside the cutting blade for a specific reason. These wheels serve as *feeler gauges*. They follow the contour of the field and automatically adjust the cutting blade to the correct depth—independently of the tractor driver.

When these gauge wheels come to a high spot or ridge, they ride up on top of the ridge and this forces the blade to lower and cut through the ridge. The soil is then carried along by the blade until the gauge wheels go into a hole or depression in the field, which forces the blade to raise and fill the depression.

Eversman offers land smoothers in sizes and price ranges to accommodate your size operation and your regular wheel tractors, from 3-plow to 5-plow models. (Blade widths 9' or 12', lengths of 32' or 45'.) Write for folder which gives complete information.

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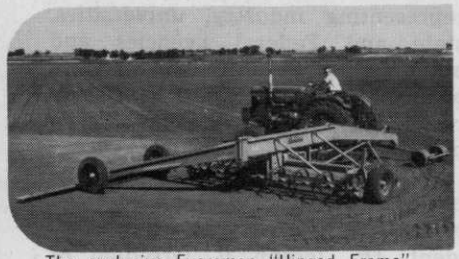
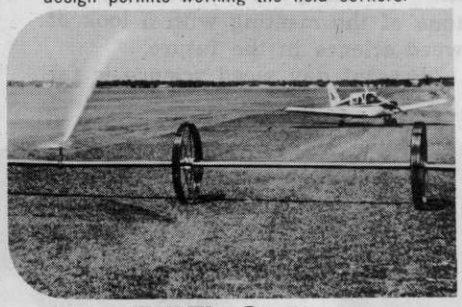


The exclusive Eversman "Hinged Frame" design permits working the field corners.



Users Tell The Story

"We have been using Eversman levelers for over fifteen years," writes Dale Habenicht of H & E Sod Nursery, Inc., Tinley Park, Illinois. "Several other types were tried, but we've always found the Eversman to be the most satisfactory. They give us the smooth surface we are looking for—with easy maneuverability.

"The H & E Sod Nursery operates three farms consisting of 1300 acres. I commute between farms with my Cherokee 180 and use the sod fields that have been leveled by the Eversman for landing strips."

"We could not properly prepare our seedbeds without the Eversman Leveler," writes Parker Sherling, Manager of Princeton Turf Farms, Inc., Centreville, Maryland.

"In preparing our fields," Parker Sherling continues, "we instruct our operators that a field is not ready until a car can be driven in any direction at 40 miles per hour over the field. It's a joke, but we actually bring our fields to this condition.

"Our operators have also developed the skill where we can shape our drainage ditches with the same machines, thus saving the rental of additional equipment."

For More Details Circle (121) on Reply Card

SILVER ANNIVERSARY

Southern Weed Science Society Report

NEARLY 800 weed control specialists helped celebrate 25 years of weed science when the Southern Weed Science Society met in Dallas in mid January. In what might be considered a time to reflect on past accomplishments and speculate on weed science in the future, delegates representing industry, universities, state and Federal agencies and others appeared optimistic in spite of the threat of increased legislation restricting the use of certain crop protectants.

Carrying out the theme of the conference, "After 25 years of weed control—what's next," Society president, Dr. Joseph R. Orsenigo of the University of Florida set the tone of the meeting with a look at weed science in the future.

"Present day weed science is far removed from the 'man with the hoe' image and weed science in the '70's and beyond can be expected to follow the accelerating rate of change so commonplace today," he said. "Our discipline will develop as an independent and as a dependent science with major innovations from our own research efforts and from technological advances in other disciplinary areas, particularly engineering."

Orsenigo cited the applicability of UHF electromagnetic fields and laser methods to weed science now under study. He said that "despite the popular unreasoning attack on pesticides, chemical methods offer the most promising near future tools in vegetation management, crop and crop seed protectants, detoxifiers, weed seed germination stimulators and plant modifiers. These will be selected, developed and utilized increasingly, each with built-in safeguards for the environment."

Dr. James G. Wilson, Professor of Research Pediatrics and Anatomy, Children's Hospital Research Foundation, College of Medicine, University of Cincinnati.

President Orsenigo told members that weed science must help to communicate with the non-agricultural 95 percent of our population and "carry the positive message of a viable agriculture that totally serves the common good."

The keynote address of the conference was a talk by Dr. James G. Wilson, professor of Research Pediatrics and Anatomy, Children's Hospital Research Foundation and the University of Cincinnati College of Medicine. Dr. Wilson drew much response from Society members in speaking on "The Teratogenic Potential of 2,4,5-T." This pesticide has received more notoriety and probably been the cause of more public concern than any other such substance except the insecticide DDT, he said. The herbicide has been accused of causing human birth defects in three areas of the world. He pointed out that the compound is teratogenic, "but so are hundreds of other commonly used drugs, plant products and environmental chemicals . . . . the list of chemicals now known to be teratogenic in rats, mice or rabbits is so extensive that it is quite natural

Officers of the Southern Weed Science Society discuss the 25th anniversary. Standing (l-r) are: Turney J. Hernandez, President-Elect, E. I. Du Pont de Nemours & Co., Inc.; Dr. Joseph R. Orsenigo, President, Everglades Experiment Station; and Dr. Allen F. Wiese, Vice-President, Texas A&M University, Texas Agricultural Experiment Station.

to ask if not all chemicals might be damaging to embryonic animals under the right conditions."

Following the general session conferees divided into sectional groups to hear more than 200 papers on weed science. J. D. Bird, rights-of-way specialist for the Georgia Power Company related his findings on reclearing utility ROW. He said that his utility company currently mows rights-of-ways every three years and uses a helicopter to spray swamps, hilly or rocky terrain or any other inaccessible area. Reclearing is done at about $6 per acre per year. But he pointed out that reclearing in this manner was merely removing three years growth from the top and not affecting the root system. "Within one week after bush hogging the resprouting has started again," he said.

Bird said that brush chopping offers possibilities for reclearing ROW. Blades on the chopper penetrate the soil and cut the root system. "By cutting the root system we disturb the brush enough to slow down the growth and thereby lengthen the reclearing cycle," he said. "The use of herbicides in inaccessible areas also aids in lengthening the cycle."

The specialist concluded his report by comparing costs of mowing and chopping. He estimated that chopping costs $18 per acre. "This compares to $18 per acre for cost of bush logging for a three year cycle, or $6 per acre per year," he said. "The chopping we expect to last four years at a cost of $4.50 per acre per year."

John E. Gallagher of Amchem Products, Inc. reported on the performance of A-820, a preemergence compound for the control of crabgrass in ornamental turfgrasses. Results of tests indicate that the chemical gives good control of crabgrass in cool-season grasses at 4 pounds per acre and at 6 pounds per acre for warm-season grasses. Turfgrass tolerance in field trials of A-820 was excellent, said Gallagher. There was only one instance of injury to bentgrass in any of the spring-applied tests and it was slight.

Also on the program was a progress report on the use of Krovar I, a bromacil-diruon mixture. F. E. Gonzalez and Tom Evans of the Du Pont Company said that tests under southern conditions indicated a broader spectrum of weed control with this compound. Broadleaves as well as grasses and hard-to-kill perennials were controlled using lower rates of the compound than similar rates of either chemical applied as a tank mix combination.

In relating the "public relations of public spraying," Lyle McCutcheon of Dow Chemical Company said that spray crews should be familiar enough with the chemicals they are spraying to be able to tell the interested public when asked. Make use of displays, bulletin boards and other means of communicating, he said.

In the area of aquatic weed control, William M. Bailey and Randy L. Boyd of the Arkansas Game and Fish Commission presented some observations on the White Amur in Arkansas. They report that the Amur has been one of the best biological control agents for aquatic vegetation of those tested. Spawning attempts were successful in tests in 1970. This provided fish for research which were stocked in isolated lakes for observation. Digestive tract studies indicated the fish was entirely herbivorous. There appeared to be no competition with other fishes, they said.

The conference closed with a number of resolutions passed. One that affects the industry as well as the general public was the resolution to request from the United States Department of Agriculture a yearbook on the cost of weeds.

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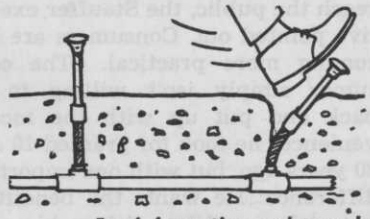

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Industry Executive Predicts Brighter Chemical Future

A spokesman for the agricultural chemicals industry has predicted a swing in public opinion toward a more reasonable outlook on the use of pesticides.

Harold L. Straube, vice president and general manager of the Agricultural Chemical Division of Stauffer Chemical Company, said that a reversal from the extremist views against pesticides is forthcoming. He based his predictions on four theories:

1. House passage of a new Federal pesticide control act that "does not represent extremes but promotes, instead, a common-sense middle ground in which the industry, responsible environmentalists and the government can work together."

2. Recognition by industry of the need for products that are ecologically safe.

3. Realization by the general public that the benefits of modern living also involve certain environmental risks.

4. More effective communication between the pesticide industry and the press.

Pesticide producers must not repeat past industry mistakes, warned Straube. He cited a communications breakdown with the general public and a lack of response to changing social needs as a notable industry mistake.

"We did not get our story across," he said. "We felt we could let our scientists answer questions that arose, and eventually people would understand the basic truths about pesticides." But the public was not aware of the benefits produced by agricultural chemicals.

". . . If pesticides were withdrawn from U.S. agricultural production . . . the price of farm products would likely increase by 50 to 75 percent," he said.

This message is now beginning to reach the public, the Stauffer executive pointed out. Consumers are becoming more practical. "The consumer simply isn't willing to go back and put up with the inconveniences he took for granted 10 and 20 years ago, but with one important difference: He wants the benefits—but at less and less risk to him and his environment. Products that meet these new requirements are now appearing on the market with more and more frequency."

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Some manufacturers own their distributors. Not Jacobsen. Like Ralph Christopherson of Wisconsin Turf Equipment Corp., Janesville, Wisconsin, shown in the photos, all Jacobsen distributors are independent businessmen. Which makes us Jacobsen customers, just like you. And that means before we ever sell any Jacobsen turf equipment to you, Jacobsen has to sell it to us first.

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But the best reason is that the Jacobsen turf line is the most complete line there is. No matter what kind of turf you have, we have the right kind of equipment for you. Equipment to keep your turf looking great. Anywhere there's turf.

So that's why all Jacobsen distributors are turf-care specialists. We can't afford not to be.

Your Jacobsen Distributors.

Before we sell it, we buy it.

For the name of the distributor near you, write: Jacobsen Turf Distributor Directory, 1721 Packard Avenue, Racine, Wisconsin 53403.

Eron Invents Aerator and Water Treatment Device

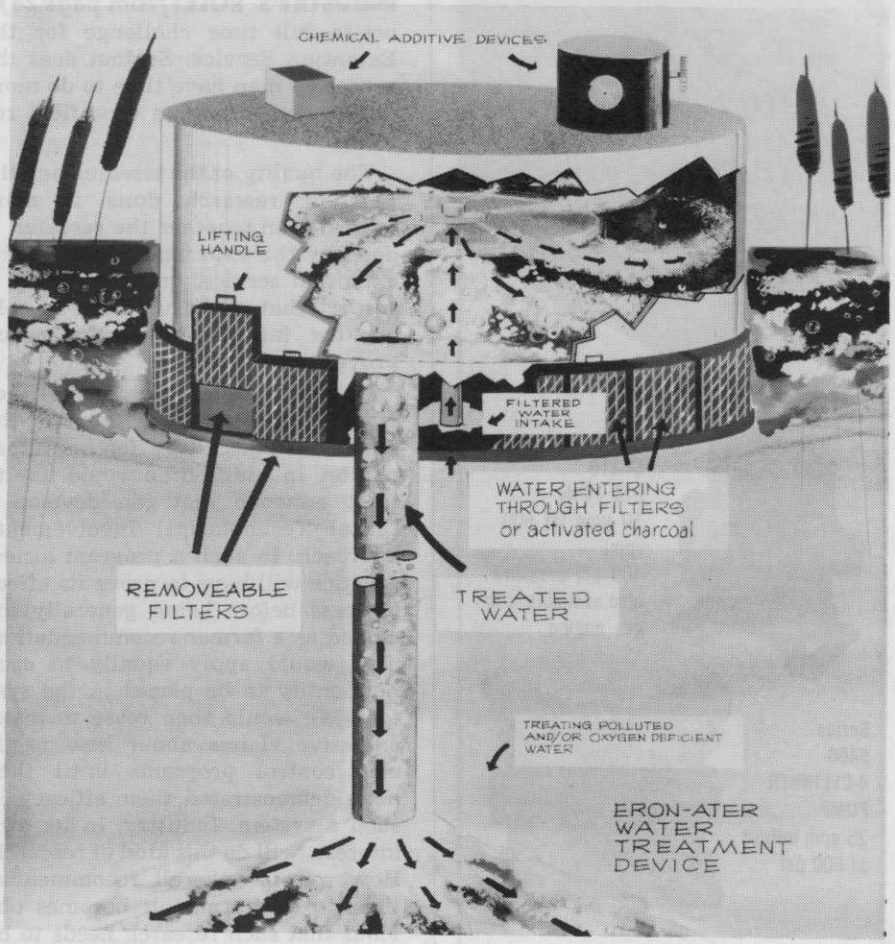
A prototype of an aerator and water treatment device is being developed by Robert E. Eron, Eronventions, St. Petersburg, Florida. The new machine provides a highly efficient transfer of oxygen or other chemicals to polluted water.

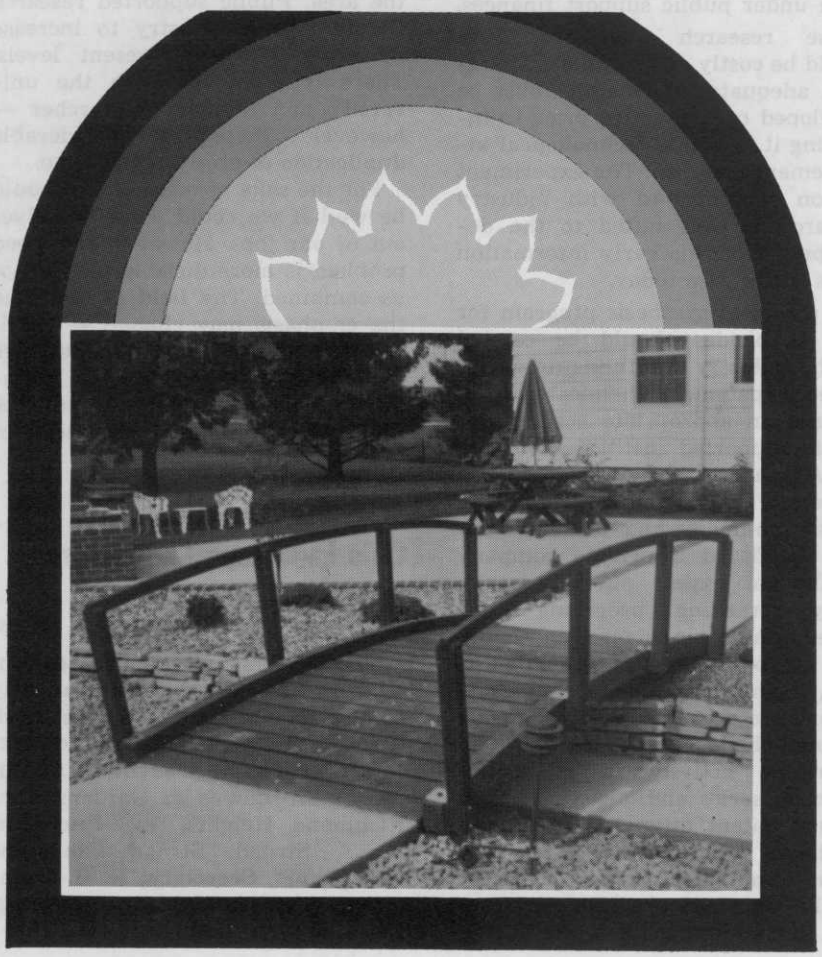
According to Eron, the aerator has, within its closed exchange chamber, a specially designed impeller located at the upper end of the water intake tube. The impeller slings finely divided water outwardly with considerable and controlled turbulence. Thus, the interfacial exposure of the water is increased.

Eron told WEEDS TREES and TURF the aerator floats on the water surface. The unit weight is less than 200 pounds and the unique design allows for only one moving part. It is powered by storage battery.

One aim of the aerator is to utilize the chamber of the device to build up a pressure head of treated water, says the inventor. This allows the pressure differential to force the

(continued on page 39)





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Write for FREE, descriptive literature and prices on the Porta-Span® bridge.

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◀ For More Details on Preceeding Page Circle (140) on Reply Card

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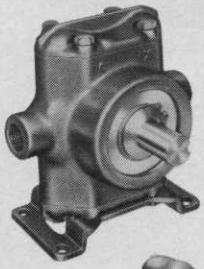

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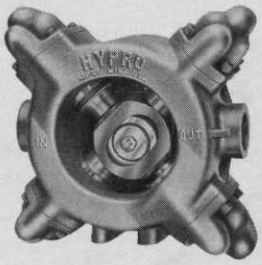

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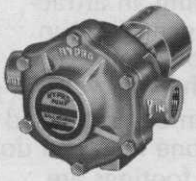

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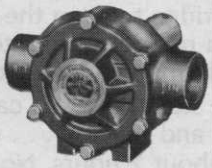

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INDUSTRY'S ROLE *(from page 24)*

priate full time challenge for the Extension Service. Seldom does the extension man have time to do more than a demonstration type field research.

The quality of the research and the type of research done is more critical than whether the research is done by the experiment station, the extension service, or by industry. I suspect that all of us learn to rely on that information source which proves to be accurate.

It is my belief that the farmer would prefer to look toward the schools of agriculture for his information. In addition he would like to trust someone that can develop a "Total Technological Involvement" approach. In such a program a new practice will have to prove its effectiveness before being generally included as a farmer recommendation. This would apply equally to each new entity to be placed in the system. We would then cease to make excessive claims about new pesticide control programs until they have demonstrated their efficacy in such a system. Industry, in its own interest, will do this kind of research. However, for overall recommendations to the farmer, it becomes obvious that such research needs to be done under public support finances.

The research suggested here would be costly and complex. Therefore, adequate information must be developed on a practice prior to including it in a total technological involvement program. The experiment station supplementd with industry research is well suited to the development of this early information — as is the case today.

A chemical synthesis program for new herbicides should be carried out by industry. Synthesis programs aimed at patenting chemical entities are not an appropriate activity for public supported institutions.

A synthesis program done in a university under the direction of a private company and primarily for the benefit of a private company should not expect public support. Early screening programs done under similar arrangements should also not be done at public expense. Few, if any, public supported institutions are organized with adequate organic chemists and biologists to determine activity in an *entire* chemical series and, also, have well trained patent attorneys to suggest synthesis programs, to write the patent, and then to protect it. A poorly conceived program may succeed in "muddying the water" sufficiently to destroy all commercial interests in the area.

With development costs as they are today, no company can bear the development costs without some patent protection, and under conditions that give the full seventeen years originally intended in the patent laws. Thus, an important discovery may never be developed if it lacks full and complete patent protection.

It should be obvious that the patent system must be allowed to function fully. Without such protection, research and development monies will disappear. Not only will there be no new products for industry, but there will be no new products for agriculture, and mankind will not have the benefits of cheaper and more abundant food supplies.

I was surprised to learn the amount of "mechanism of action" and other so-called "basic" research that goes on in industry. Here it is taken for granted that this type of research must be done to gain label clearances, and it may be helpful in extending the chemical activity of any one chemical series.

Much of industry's research is not published due to the fact it may be continuing to develop leads within the area. Public supported research should expect industry to increase its research above present levels. There is room for both the university and industry researcher — however, there is considerable duplication of effort at this time.

For the sake of mankind, it would be well if we could work ourselves out of our jobs. However, the weed problem is more durable than all of us combined. The field of play and the emphasis may change — but it will remain a professional challenge in spite of the best talents in industry, the university, and the Agricultural Research Services of USDA.

Ohio Landscape Contractors Elect Officers

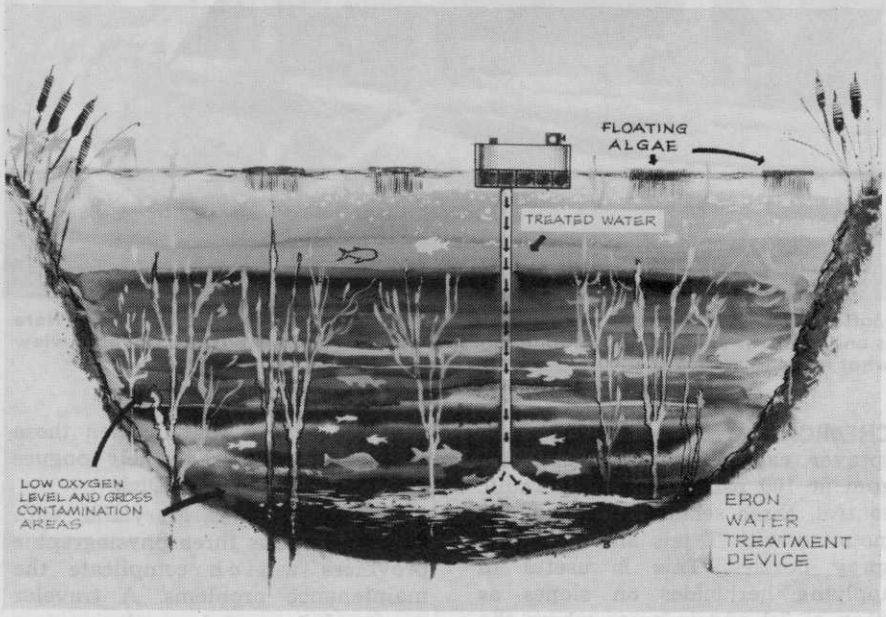
The Professional Landscape Contractors Association of Ohio recently elected new officers. They are: N. H. Strnad, Strnad Landscape Contractors, Cleveland, President; V. Apanius, Better Lawns & Gardens, Inc., Richmond Heights, Vice-President; N. T. Strnad, Strnad Landscape Contractors, Secretary; R. C. Swinerton, Swinerton's Landscaping, Eastlake, Treasurer.

ERON *(from page 37)*

treated water down to the bottom of the water. This feature can permit the unit's use in treating sewage and industrial wastes.

The aerator can also be used in mixing and adding concentrated chemicals to water. An applicator can apply chlorine, bactericides, herbicides, and medications through the aerator thus insuring a good mixture and safe dilution.

Eron says that the aerator is useful in applying gasses to liquids without polluting the air environment.



Canada Thistle Threat To Green Industry

Canada thistle, one of the most serious weeds in the midwest is a problem to farmers, nurserymen and industry alike. Many utility line, rail and highway rights-of-way and other noncropland are contaminated with this problem weed.

Canada thistle is a perennial plant and spreads by seed and a vigorous root system. It's difficult to control by chemical and cultural methods.

Amitrole, a good herbicide for controlling Canada thistle, can still be used on non-cropland, says Edward Stroube, extension agronomist at Ohio State University. It should be applied before the thistles reach the bloom stage for best control. Picloram (Tordon) is an excellent material for thistle control on noncropland and can be applied anytime there is green foliage on the thistle plants. Tordon should not be used near desirable trees or shrubs nor near a water supply, Dr. Stroube cautions.

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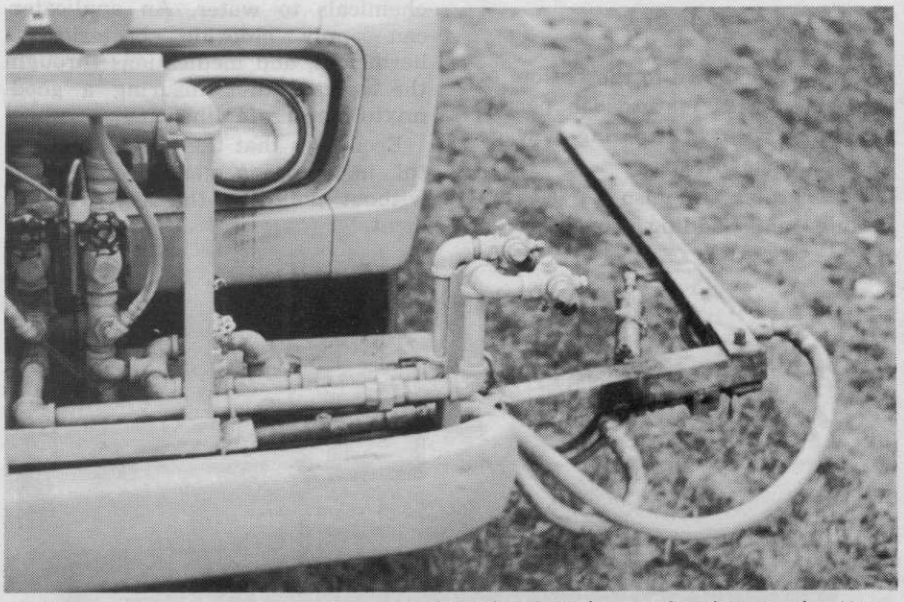

Moffett and his crew have designed and made spray booms for their trucks. Here is one made of channel steel. Mounting on front of truck permits the driver to view what is being sprayed.

CHEMICALS *(from page 28)*
sprayer capable of producing 100 gpm at 100 psi. It has a hydraulic control, three section 24 foot boom mounted with T jets and broadcast spray nozzles. This is useful in applying herbicides on slopes as steep as 3:1 and in areas where the spray must be restricted to prevent herbicide damage.

"We had to modify our spraying equipment in order to meet highway needs," notes Dick. "We wanted larger tanks that would hold thousand gallons. We also made our own booms."

He says their spray equipment is worked; it doesn't just sit around. Crews spray eight to nine hours a day, 130 days a year. "When those sprayers are turned in their tongues are hanging out," says Dick.

Like some states, Maryland, with 23 counties, has three physiographic provinces which complicate the maintenance problems. A traveler coming from east to west can pass through Coastal Plain Piedmont, and Appalachia provinces. Each province has its own geographic differences including soil types and vegetation species. Incorporating a chemical program to encompass all vegetation problems is quite an undertaking.

"We try to start our spraying operation by early to mid April," says Don Cober. "We go to the southern counties first to combat early vege-

Spraying personnel were former rights-of-way maintenance men. Donald B. Cober, agronomist, (left) engages in a discussion with: (l-r) Gilbert Mills, lead landscape chemical applicator; Marshall Von DenBosch, landscape chemical applicator; Clarence Gough, landscape chemical applicator; John Dusty Rhodes, Jr., landscape maintenance supervisor; and Robert Duke, lead landscape chemical applicator.

tative growth." It also allows crews to spray roadsides before neighboring farmers set tobacco or tomato transplants.

"Early sprays are for garlic, young brush and winter biennials," says Moffett. "This calls for selective herbicides such as 2,4-D or 2,4,5-T, depending on what's to be sprayed." As crews work northward they vary chemicals, rates and application techniques to match the vegetative conditions of the area.

"We don't want brown out," says Moffett. "We're after herbaceous material but not at expense of changing the color or the natural vegetation. Last year we sprayed out further into the ROW. The fall coloring that resulted seemed to blend into the surrounding countryside and people didn't notice it so much."

The agronomist has tested residual chemicals around sign posts, markers and guardrails with success. However he finds that these chemicals contribute to erosion problems when used in too high a concentration.

"For guardrails we prefer to apply residual and contact chemicals that will give abatement in a two-step operation, he says. "This combination allows for vegetation control within the guardrail area but not the problems associated with lateral movement of chemicals.

Another area where Moffett and Cober have applied their chemical knowledge is in growth retardants. They report varying results with applications of maleic hydrazide in the fall. But good inhibition has been obtained in the spring when treatments are made between April 20 and May 15. Areas sprayed after this time require mowing to remove seed heads.

"Use of growth regulators has been more effective on better turf areas," says Moffett. "We fertilize weak stands of grass in areas where we anticipate using MH-30T. There is a slight discoloration to grass when treated in the spring. Compared to untreated grass, a treated section will remain a lighter green color, then progress to a richer green color in later June. The darker green color is retained until fall."

Moffett notes that the period to apply maleic hydrazide is only about a month long. "If the material can be put on in the early part of the application month, the grass will grow to a height of approximately 8-10 inches," he says. "But as you approach the latter half of the month, there will be at least one mowing required to eliminate the seed heads. The formal cost of the material restricts its use to high maintenance cost areas such as guardrails, curbed medians, bridge abutments and steep slope areas which require hand mowing. In the last two years, the cost of MH-30T has dropped significantly so that it is now used in quantity along our roadsides."

Don Cober says that one indicator of their success with this integrated approach to ROW maintenance has been the acceptance of the program in the districts. "We try to stay ahead of things," he says,

Staying ahead means coming up with new and different approaches and solutions to maintenance problems. Moffett and Cober are currently working on a series of manuals including such aspects as herbicides, slope management, mowing standards and others. Closely tied to this will be different job titles for personnel involved with chemicals and their application. Underlying the entire concept is the fundamental principle of safety to the motoring public.

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HERBICIDES *(from page 16)*

In downtown areas we have some lined ditches plus an underground storm drain system, but elsewhere in the city most of the ditches are open and unlined. The average ditch is 10 feet deep and about 10 feet wide with a 1½:1 slope. Some of our main ditches, however, are 20 feet or more in depth. Vegetation flourshes and can quickly crowd and overrun ditch banks, bottoms and berms.

Obviously, these drainage ditches must be kept clear to allow for a free flow of water that is carried through the system of laterals to the main ditches or canals and eventually into the St. Johns River.

Historically, the city has depended on cutting and chopping to keep weeds and brush in check. But increases in hourly wage rates ranging five and six times above levels of a decade or so ago and shortages of people interested in the hard physical labor involved in hand chopping and mechanical cutting have spurred our interest in alternate methods of keeping the ditches clean. One of the largest expense items in our maintenance budget has been ditch bank weed and brush control. It, therefore, offered real potential for operating economy — if we could demonstrate feasibility for a new approach.

Investigation showed that proper application of a safe weed and brush chemical such as Ammate X would halt weed and brush growth in the ditches. We found this non-volatile, water soluble compound could be safely used in the residential areas served by the drainage ditches, because it is low in toxicity to man and to animals. And so in 1970, we decided to move ahead with this new chemical spray program.

Initially we purchased a Myers trailer-mounted spray rig. Success with this rig encouraged us to add two John Bean truck-mounted rigs. So we now have three spray units in operation. The Myers sprayer has a 300 gallon tank while the other two rigs have 500 gallon tanks. All are equipped with 300 feet of hose. This makes it possible to reach remote areas away from roads and to operate for worthwhile periods of time without recharging.

Our vegetation problems involve the control of tall growing weeds and grasses such as giant dog fennel, ragweed, camphorweed, canegrass and coffeeweed and also control of woody plants like elderberry, wild plum and willow. When this undesirable vegetation is controlled, however, we find we can develop a useful ground cover of Bahiagrass, centipede grass and Bermudagrass. This is our ditch bank objective, for

Looking over a map of Jacksonville's drainage ditch system is C. C. Holbrook (seated), division superintendent, Streets and Highways. Behind him are (l-r) Stanley C. Abramson, technical supervisor for Southern Mill Creek Products, Inc., a chemical distributor; Cone Revels, Works Agency superintendent; W. M. Hood, supervising engineer, Streets and Highways; and F. Eugene Gonzalez, Du Pont weed specialist.

these grasses can be readily trimmed and maintained. Sometimes adjacent lot owners help with the maintenance since they are interested in a neat appearance in their neighborhood, but they can be overwhelmed and discouraged by high dense growth.

To control the ditch bank vegetation with the minimum amount of material and to eliminate any possible spray drift problems we have been using an invert emulsion. This system combines Ammate X with oil and emulsifier, so that the oil and water mix. By using one gallon of emulsifier, 14 gallons of No. 2 diesel oil and 60 pounds of Ammate X in 100 gallons of water, we obtain a thick, water-in-oil inverted emulsion.

We have three maintenance areas in the city — North, South and West — and we have a spray crew working in each of the areas during the growing season which sometimes is 10 months long. Our aim has been to cover the entire system of ditches during the course of this period. This is all the more difficult as we do not have direct access to many of the ditches and much of our material must be applied with the truck parked at a remote location. Each of the our crews, however, has averaged 900 gallons per day.

Overall, we have been able to get more effective and economical weed and brush control with these three crews on the job than we used to have when we relied entirely on chopping and cutting. For in those days we could see that two or three cuttings a year were the only way to keep vegetation down — yet it was tough hard work and we never really caught up with the job. It is significant that with the chemical program our three crews can now control weed growth and in effect handle a job that must be done, yet would not attract workers if we were still relying on cutting and chopping on the slopes. In a sense, a spray crew can do as much as 30 or more cutters and choppers.

Naturally, we still do considerable mechanical cutting of areas adjacent to the ditch banks. But the chain-link fences near housing developments make it impossible to move heavy duty cutters in close. Other ditches are not accessible to mechanical cutters. To control weeds and brush in these situations, we park a spray rig as near as possible to the ditch and use a spray gun and hose to reach vegetation areas. Good planning is vital, since it is often difficult to reach remote ditch areas from available roads or drives.

A weed abatement program such as ours can be modified to provide for longer control of unwanted vegetation. Initially, we have been concerned with stopping growth of undesirable weed and brush species.

We have not experienced any concern from the public on the chemical program but in the event any question should arise, our crews have the facts to summarize our program and emphasize its safety.

As our program develops, we can see the need for keeping our crews properly trained, so the materials they use will be correctly applied. On-the-job training is, therefore, very much in our minds.

We recognize that our ditch bank chemical program is still new — and we have much to learn. But we have been encouraged by what we have been able to do with safe, non-volatile chemicals. Our ditches look better; they will carry a greater volume of water. And we have been able to achieve the improvement without increasing costs to the taxpayer. We have had a good, positive reaction from the public. We intend to keep it that way.

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Management Factors Affecting Sod Heating

The production of turfgrass to be sold for sod has become one of the fastest growing areas of agricultural production in Maryland, says an agronomist from the University of Maryland. Production methods have relied upon a combination of trial and error and research data on turfgrass for other uses.

"Until recently research in the area of sod production has been negligible," says Charles H. Darrah.

He conducted a study to increase the level of knowledge in the area of quality sod production. Specifically the research was concerned with post-harvest injury of turfgrass sod.

The affect of sod heating after harvest has been under investigation at the University of Maryland since the summer of 1969. Pre-harvest treatments have included different mowing heights, nitrogen rates, clipping removal, cutting depths and time of day of harvest. Each of these treatments has been evaluated for its effects on sod heating and regrowth.

Small pads of Kentucky bluegrass-red fescue sod, 18 inches by 18 inches, were harvested and stacked in insulated boxes, where they were allowed to heat for three days, reports Darrah. Temperatures were measured and recorded in two hour intervals by means of thermocouples placed in the center of the stack. At the termination of the experiment, eight inch diameter plugs were cut from the center pads.

"Plugs were then transplanted into pots filled with a sand-soil-peat mixture and allowed to grow for 20 days," says the agronomist. "At this time root and top regrowth measurements were made."

Results indicate that mowing at one inch and removing the clippings are the most effective ways to reduce sod heating injury, he reports. Close cutting and clipping removal reduced the temperature build-up and respiration rate. Top regrowth was significantly increased and root production was equal to or better than sod mowed at either two or three inches.

The researcher notes that high rates of nitrogen (2 lbs/1000) have also been shown to be detrimental to sod recovery. The rate of heating and final temperature of high nitrogen sod were much higher than sod maintained at low nitrogen levels.

Time of day at which the sod is harvested also affects temperature buildup in the stack. Temperatures between a 6 a.m. and a 3 p.m. harvest differed by as much as 10 degrees F and 101 degrees F, respectively, after only 24 hours of heating.

Darrah concludes that experiments involving cutting depth have shown one-half to three-fourths inches give optimum results. Although a no soil treatment gave root regrowth equal to that of the one-half and three-fourths inch depth, its heating rate was excessive. The average was 8-10 degrees F higher than the three-fourths inch cut. Although one inch depth of cut showed less heating, root initiation was exceptionally slow at this thickness.

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Midwest Turfgrass Growers Attend Meeting In Lincoln

The third annual meeting of the Midwest Turfgrass Growers Association was held in Lincoln, Nebraska, in early January.

Elected officers are: President, William Latta, Princeton Turf Farms, Kansas City, Mo.; Vice-President, Don M. White, Iowa Nursery Sod Co., Des Moines, Iowa; Secretary-Treasurer, Claude L. Wiewel, Wiewel's Sod Farm, Inc., Quincy, Ill.

Directors for the organization are: Ed Keeven, Emerald View Sod Co., O'Fallon, Mo.; Joe McDermott, Loveland Turf, Omaha, Neb.; Mel Briggs, Briggs Sod Co., Stilwell, Kans.; Paul West, West Sod Farm, Fountain, Colo.; Norman LeGrande, Hendrick's Sod Co., Lincoln, Neb.; and, Don Hanson, Hanson Sod Co., Holdrege, Neb.

Committee reports indicated progress being made in several areas. Seed people generally accepted the full 25-grain analysis on all seed and full 50 grams on Merion. Seed specifications of the Midwest Turfgrass Growers Association are being met in full.

Ed Keeven reported that Wynard Aslin, Standardization Chairman of the American Association of Seed Certification Agencies, has specifications. He pointed out that AAOSCA had been most generous by asking for suggestions and approvel of standardization practices.

Norman LeGrande, Lincoln, Nebr., expressed concern for the effect of the Occupational Safety and Health Act on the industry. He highlighted the requirements and penalties as they apply to sod producers.

The removal of sod production acres from crop acres — no longer acceptable as set-aside acres — in the Feed-Grain Program was also discussed. A committee was appointed to investigate and recommend possible steps that might be taken by the Association to correct the situation.

Agrico Moves Sales Division to Memphis

B. J. Farmer, Jr., vice president of Marketing for Agrico Chemical Division, Continental Oil Company, has announced the transfer of the Turf and Garden Products Sales Division headquarters from Carteret, New Jersey, to Agrico headquarters at 5050 Poplar Avenue, Memphis, Tennessee.

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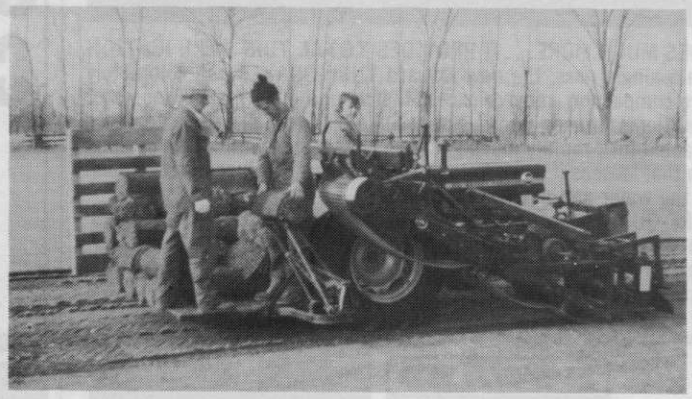

For More Details Circle (158) on Reply Card

Scientists Honored By Northeast Weed Society

Awards were presented for two outstanding papers at the 26th annual Northeast Weed Science Society. Honored were Madelene E. Pierce, Denise Alessandrello, A. R. Templeton and W. Hurtt.

In "A Study of Organisms Living in the Heated Effluent of a Power Plant," Madelene Pierce and Denise Alessandrello compared the flora and fauna in the heated effluent of of a power plant with that of two adjacent control areas on the Hudson River. They found that due to rapid cooling of the heated effluent entering the river, little adverse effect on the river as a whole occurred. In the area nearest the outlet of heated effluent, however, only two species of aquatic weeds were found and their distribution was limited as compared with the control areas.

Although differences in flora and fauna between the areas tested were minimal the authors warned that if the heat plumes of several closely spaced power plants were to merge, significant biological effects could occur.

A. R. Templeton and W. Hurtt reported on "the Effect of Pre-treatment Environment on Herbicidal Response and Morphological variation of Three Species." They said that plant growth habit and herbicide response were affected in all species tested. They used growth chamber, greenhouses and field locations to provide three separate sets of environments. Light, temperature and humidity recordings were made and plant responses were noted in each environment.

Plants were then sprayed with sub-lethal doses of acetic acid at different stages of growth. The authors concluded that plant responses to herbicides growth under different environments can be affected greatly by the environment.

Jacobsen Publishes Service Manual For 2-Cycle Motors

The first easy-to-read service manual entirely devoted to the subject of 2-cycle engines has been published by the Product Training Center of the Jacobsen Manufacturing Company, Racine, Wisconsin.

The manual has been designed for easy reading and quick reference for the classroom, the service shop, and the consumer.

Both vertical and horizontal 2-cycle engines are covered in the profusely illustrated 104-page book. Its subjects include: principles of operation; troubleshooting; service data; engine overhaul, and cleaning and storage. Special introductory chapters deal with horsepower, torque and speed.

According to Ronald J. Eckhardt, Supervisor of Product Training for Jacobsen, the program was developed with several groups in mind—industrial arts classes, service schools, dealer training and user orientation.

"In aiding the industrial arts instructor," says Eckhardt, "the manual would be the student's workbook."

Jacobsen expects that the 2-cycle instructional program also will be of significant help to the consumer and commercial distributor in training dealers and commercial users such as golf and parks department personnel in both operating and servicing of 2-cycle engines.

For more details about the manual, please circle (721) on the reader reply card.

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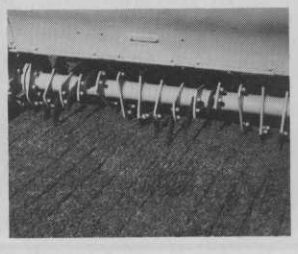

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For More Details Circle (104) on Reply Card

For More Details Circle (142) on Reply Card

ASPA Plans Canadian Summer Meeting

Canadian members of the Nursery Sod Growers of Ontario will host a major summer event for the American Sod Producers Association July 10-12 at Toronto, Ontario, Canada.

Headquarters will be the Skyline Hotel with registration and a "get-together" the evening of July 10.

The feature program will include several sod farm visits during the next two days plus a major field day with demonstration equipment. Manufacturers of sod harvesting equipment are tentatively slated to be in action.

A complete ladies program for both days is in the planning stage. Tentatively it includes a visit to Ontario place and special shopping tours.

Complete details will be announced as plans for the summer field day events are firmed up.

Vandermolen To Market New Brush Chipper

Diadem chipper, a new, compact chipper for trimmings, roots and branches up to 2½ inches diameter has been introduced by the Vandermolen Corporation of Livingston, N. J.

According to the manufacturer, the chipper can reduce a mountain of brush to a bagful of small chips. Chips make ideal mulch or ground cover.

Compactness is the key feature of the Diadem chipper. The 7 horsepower skid model measures 30 inches high by 18 inches wide. It is also available as a wheeled model. Weight is 153 pounds.

For more details, circle (723) on the reader reply card.

Florida Group Sets Trade-Education Show Date

"Better Turf-Grass for Better Ecology" is the theme of the 11th Annual Florida Turf-Grass Association's Educational—Trade Show. The educatonal and commercial exhibits as well as the meetings will be held at the Deauville Hotel, Miami Beach, Florida, May 7-10. Equipment demonstrations and the annual Scholarship Golf Tournament will be at the North Dade Country Club.

The event is a coordinated activity of the Association and the Florida Institute of Food and Agricultural Sciences, University of Florida, as well as County Extension Directors and the Extension Service of the University.

Over 700 turfgrass and ornamental maintenance oriented personnel are expected to attend this meeting. It is the only educational —Trade Show in the United States encompasing the materials equipment for management of Florida and the Caribbean turfgrasses. This rapidly populating area plus an impact of increased level of turfgrass management for better ecology in this twelve months a year of turfgrass maintenance climate has made this market one of the fastest growing in the United States.

A number of speakers are scheduled for the educational meetings, according to Dr. Bryson James, Center Director Agricultural Research Center, Ft. Lauderdale.

Cemetery operators, horticultural sprayment; city, county and state parks; schools, military and highway personnel as well as lawn maintenance contractors and golf course superintendents will be studying the more efficient, effective and economical way to do their job of producing "Better Turf-Grass For Better Ecology."

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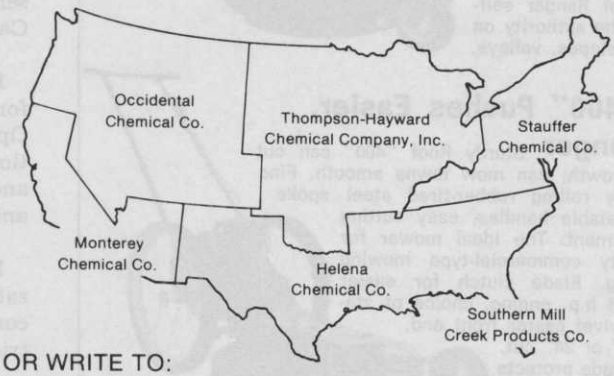
ANNOUNCES NEW NOZZLE LOAN PLAN

HERE'S HOW THE PLAN WORKS:

Ask your FoamSpray Products distributor for the number of FoamSpray aerial or row crop nozzles needed to rig your spraying unit. Up to 50 nozzles will be loaned to you for a small handling fee of $15.00. (Suggested retail price of these nozzles is $4.50 each.)

These nozzles were developed specifically for application of FoamSpray Foaming Adjuvant.

See your nearest FoamSpray Products distributor for complete details.



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2345 W. MOCKINGBIRD LN.
DALLAS, TEXAS 75235
(214) 350-2792

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You have customers who need help — help cutting grass, weeds and brush in the summer months when you need help!

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Mankato, Minn. 56001

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ROOF RANGER Self-Propelled . . . Built Rugged for Less Down-time

Tilt blade for heavy cutting, flatten for fine mowing. Equip with single caster for in-tight trimming; stationary front wheels for miles of mowing. (Optional riding cart). 24" cut, 5 h.p., or 26" cut, 7 h.p. Oil bath gear drive, blade clutch, cutting height adjustment, grass catcher extend usefulness and productivity. Roof Ranger self-propelled is the authority on hills, peaks, slopes, valleys.

ROOF "400" Pushes Easier, Lasts Longer Sturdy Roof "400" can cut dense 18" growth; can mow lawns smooth. Fine balance, easy rolling rubber-tired steel spoke wheels, adjustable handles, easy cutting height adjustment. The ideal mower for **all** heavy-duty commercial-type mowing and trimming. Blade clutch for easier starting the 5 h.p. engine, choice of stationary or swivel caster front end, choice of 21" or 24" cut. Belt driven blade protects engine, simplifies maintenance.

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industry people on the move

GEORGE LIECHTY, named field sales manager for central and western U.S. for Hesston Corporation. **JIM BARDEN,** named field sales manager for eastern U.S. region. Will have responsibility for sales through distributors and supervising all related activities in marketing Hesston's grounds maintenance tractor.

* * *

WESLEY R. HALL becomes regional sales manager for the Weather-matic division of Telsco Industries, Garland, Tex. Will provide dealer and distributor assistance and irrigation consultation in west coast states.

* * *

JOHN BING to division manager of Jacobsen Mfg. Co. Rogers Division. He replaces C. D. Rogers. Rogers Division manufactures power sweepers, soil aerators, utility trailers and utility vehicles for off-highway use.

* * *

RICHARD W. FIELDS appointed manager, Industrial Vegetation Control Department, Velsicol Chemical Corporation to head up marketing and development of chemicals for industrial brush and weed control.

* * *

JAMES H. KELLER to serve as director of marketing for Hahn Corp. Will also assist in the design and installation of electronic data processing equipment for Hahn's three divisions.

* * *

VIRGIL MEIER joined O. M. Scott & Sons research division in the plant breeding research group at Marysville, Ohio.

* * *

ROBERT M. COQUILLETTE and **CARL N. GRAF** elected executive vice presidents of W. R. Grace & Co. Coquillette will be responsible for corporate administration and Graf becomes deputy group executive of the company's Chemical Group.

* * *

W. L. MARLOW appointed marketing manager, Seed Department, and **NICK LAZANEO** to dealer-consumer sales manager, Western Department for the Niagara Chemical Division of FMC Corporation.

* * *

CLAUDE MARSHALL joins Nunes Turfgrass Nurseries, Calif. as sales representative for the southern California area.

* * *

MILTON D. WEST becomes public relations manager for Ford Motor Company's Tractor and Implement Operations — North America. Will head up public relations programs involving Ford's line of farm, industrial, and lawn and garden tractors and equipment in U.S. and Canada.

* * *

EUGENE C. OKIN named president of Walton Laboratories, a division of Beatrice Foods Company. Will continue as vice president-marketing for Melnor Industries and vice president of Turf Irrigation.

* * *

HENRY B. TILLOTSON to director, procurement planning and research in the Toro Company's manufacturing services group. **ROBERT A. KENKEL,** former vice president for operations of Wheel Horse Products, Inc. succeeds Tillotson as director of engineering and manufacturing for Toro.

No One Answer To Pollution Solution

Getting rid of pollution in one respect often creates other undesirable effect, says an agricultural economist at Penn State University.

Dr. Donald J. Epp finds this "trade-off" between alternatives may exist in four aspects — between environmental quality and other needs, between geographical areas, within the various parts of the environment, and in degrees of environmental cleanliness.

Just as a family must sometimes choose between alternatives, society must make choices in the kinds of pollution it accepts, he said.

"I think we will face rather quickly the trade-off between environmental quality and other needs," he declared.

"As we . . . continue working on environmental problems, we must make known the alternative ways of getting whatever benefits people want from the environment. These are as important as knowledge of the standards for environmental quality," he said.

Dr. Epp described a Federal government estimate of $105.2 billion needed over the next 6 years to clean up the environment thoroughly. This amounts to about $17.5 billion dollars annually.

People will ask whether this is the best way to spend the money. They may point out that this money could double expenditures of all state and local governments for police protection, correctional institutions, and public assistance, he said.

The $17.5 billion is about two-thirds of what the nation spends annually for all public elementary and secondary schools. A two-third increase in financing for school systems might improve communities substantially. Cleaning up streams could also improve communities. The people must decide which expenditure will be made.

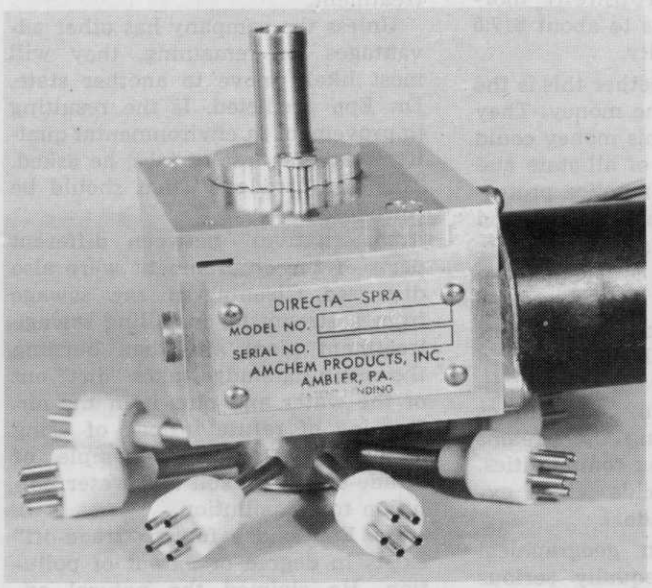
The "trade-off" in geographical areas could prove equally serious for some Pennsylvania industries, he claimed. Certain industries may be compelled to move elsewhere because of high costs required to meet strict environmental standards. Increased standards for one stream receiving sewage effluent from a paper mill will raise production costs for sewage treatment by $17.80 per ton of product. This is almost 6 times the current cost for sewage treatment.

Unless the company has other advantages for remaining, they will most likely move to another state, Dr. Epp predicted. Is the resulting improvement in environmental quality worth the loss of jobs, he asked. This is a "tradeoff" that should be considered.

"Alternatives" between different parts of the environment were also discussed. Cleaning up raw sewage from a stream by installing sewage treatment plant and then burning the resulting sludge takes "dirt" out of the water and puts it in the air. Burning of refuse instead of using land fill is another example of "trade-off" from soil and water pollution to air pollution.

Dr. Epp said a fourth "trade-off" exists in degree or extent of pollution. He claimed the natural environment consists of various degrees of cleanliness. Pollution is not strictly a man-made activity and the natural state of environment is not absolutely clean.

Man can use the environment to dispose of many waste products and the environment will clean it up—provided the system is not overloaded, he said.



DIRECTA-SPRA: Amchem Products, Inc., Ambler, Pa.

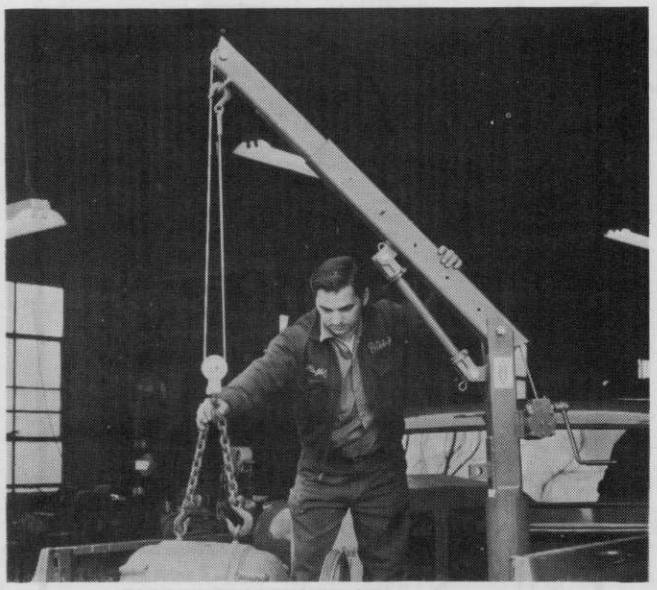
Compactness and spray drift control are the two features of this unit. It's small enough to be held in a man's hand yet capable of spraying a 20-25 foot swath. Powered by the 12-volt battery of a truck or spray unit on which it can be easily mounted with only one bolt. Considered ideal for roadsides, rights-of-ways, fencelines or other places where drift control is important. Standard or invert formulations can be applied with the Unit. For more details, circle (705) on the reply card.

TRACTOR-POWERED ROTARY LAWN MOWER: Wood Brothers, Inc., Oregon, Ill.

Three-point hitch convenience and high speed lawn mowing capability are built into this new tractor-powered rotary lawn mower. Model RM 59 has triple blades and mows a five foot swath. Unit has high suction blades and features a single V-belt drive for smoother, trouble-free operation. Standard equipment includes adjustable side skids, dual rear casters and check chains for accurate control of mowing height. For more details, circle (706) on the reply card.

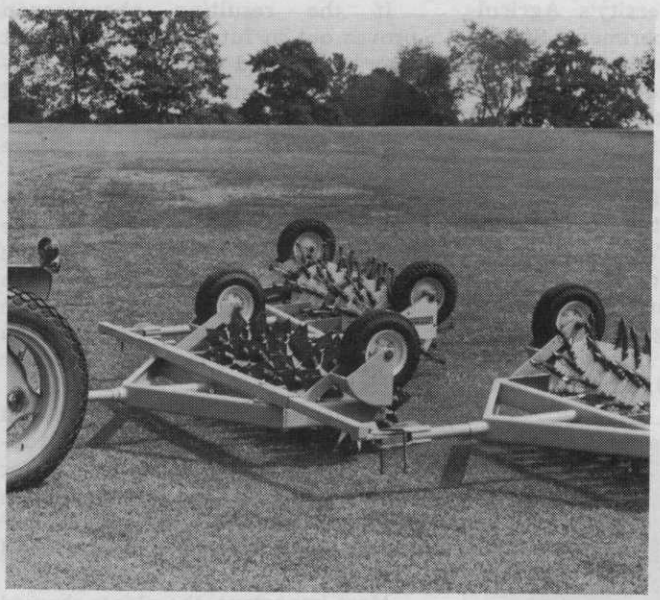
CIRCULAR BRUSH SAW: Limb-Lopper Co., Inc., Santa Fe Springs, Calif.

Here's a hydraulically powered nine inch circular saw designed for brush clearance and roundover work by street maintenance and utility line clearance personnel. Mark II, Model HRSA has a 20 degree offset angled rotary saw blade that cuts at 4300 rpm and rated at four horsepower. Angled cutting head enables operator to work ground level, on slopes or overhead with virtually equal facility. Weighs only 6½ pounds. Draws power from lifts, tractor and other hydraulic power systems. Shaft lengths may be specified 48 or 60 inches insulated or 48, 60 or 72 inches aluminum. For more details, circle (707) on the reply card.



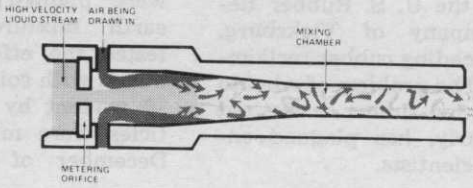
TRUCK CRANE: Weldex Corporation, Grafton, Mass.

Change a multi-man lifting job into a one man operation with this new Series T-25 truck crane. Boom can be set horizontally or raised to a 60 degree angle to give greater lift. Can be extended or retracted to meet most requirements. The worm type winch with positive self-locking can lift up to 2500 pounds with full circle swing. A standard 25 foot cable length permits maximum use as crane or as horizontal winch. For more details, circle (708) on the reply card.



AERI-BOY AERIFIER: Hahn-West Point, Evansville, Indiana

Simple flip over action allows transport of Aeri-Boy from one location to another. Designed to fill the gap between the small 30 inch and the wide 6 foot aerifiers, this unit has a 4 foot cultivating width and is equipped with nine 18 inch free wheeling discs for 90 aerifier spoons or slicing blades. A specially designed hitch permits the towing of three units for large areas. For more details, circle (709) on the reply card.



DELA-FOAM A NOZZLE: Delavan Manufacturing Co., West Des Moines, Ia.

Cover a broader range of applications with this new foaming nozzle designed specifically for aerial application. It can reduce spray drift by as much as 60 percent. Available in brass or aluminum and in sizes up to 8.1 gpm at 40 psi, the nozzle has large passageways to prevent clogging. There is no need for a foam generator. The two fluid air-aspirating nozzle delivers a straight stream pattern. Break-up of the pattern takes place within 3-4 feet of the nozzle orifice. For more details, circle (710) on the reply card.

FIBERGLASS TRUCK TOOL BOX: Hemco Corporation, Independence, Mo.

Travalite Tool Box with dimensions of 73 x 22 x 17½ inches provides a sliding tray available to either side. Concealed continuous piano hinge with self-locking stay-open braces and a built-in water drain. The color is molded-in white with a porcelain finish. Weight is 75 pounds. Ample space between tool box and truck floor is provided even though vision from rear truck window is not obstructed. Standard equipment includes locks and keys. For more details, circle (711) on the reply card.

TOP DRESSER: Cushman Motors, Lincoln, Nebraska

Apply dry or moist materials with this light cargo vehicle equipped with turf-saving 8.50 x 8 Terra Tires. The top dresser unit slides into the cargo space on the truck and is powered by the truck engine. The engine-ground speed governor keeps spreading at a precise speed to protect greens and delivers material in an even 36 inch pattern. For more details, circle (712) on the reply card.

Agronomists Report New Use For Old Tires

Discarded rubber tires, may someday be put to work to aid crop growth. Research underway at Mississippi State University points to this possibility. The research is sponsored by the U. S. Rubber Reclaiming Company of Vicksburg, Mississippi, a leading rubber reclaiming company. The problem of what to do with discarded rubber waste, old tires particularly, has plagued environmental scientists.

Drs. Rollin C. Glenn and C. Y. Ward of the University's Agricultural Forestry Experiment Station have reported a series of experiments in which ground up rubber particles were mixed with soil in varying percentages. Soybeans, selected because earlier studies showed they were sensitive to toxic elements, were planted in the rubber and earth mixture. The agronomists tested the effects of rubber when mixed with soil in amounts of one to 10 percent by weight. Rubber particles were mixed into the soil in December of 1970; the soybeans were seeded the following May.

If the resulting phenomenon proves out in future experiments, it may be that old tires will help agriculture solve one of its most critical problems—how to get crops above ground as fast as possible to ensure a successful harvest.

The higher the percentage of rubber used, the scientists noted, the faster the plants came out of the ground. Those planted in soil with a five to 10 percent rubber mixture emerged "significantly faster" than the plants grown in soil with lesser percentages of rubber.

At harvest, plants grown in soil with the higher percentages of rubber were a couple of inches shorter than the others. This was seen as an advantage to farmers, the shorter plants being less susceptible to wind damage.

Most important, the plants showed no visible signs of abnormality. Previous experiments inside a greenhouse had disclosed toxicity from the zinc oxide content of rubber. Some plants were killed, others showed abnormalities.

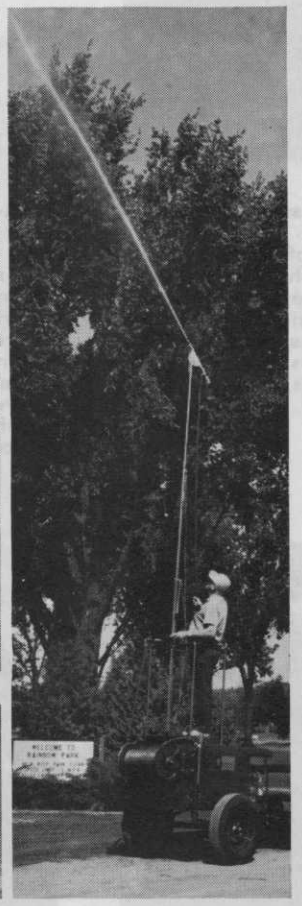
Other potential benefits were also noted. Winter weeds died off soon after the rubber particles were mixed into the soil, during the period of greatest toxicity. And if put into widespread agricultural use, rubber might help maintain zinc oxide content of animal and food products.

A similar experiment with winter wheat is now being conducted at Mississippi State, Drs. Glenn and Ward reported.

Benjamin R. Wendrow, President of U. S. Rubber Reclaiming, explained that his company's sponsorship of the Mississippi State research is an effort to develop mass uses of reclaimed rubber. Some two billion old tires now litter the landscape, with another 200 million a year being added.

Nor can this refuse be recycled in the same way as paper, glass and metal. Or buried, or burned. Buried tires tend to wriggle their way back up to the surface. If burned, they give off an oily smoke which can pollute an entire area.

Up to now, the best long-range prospect for reclaimed rubber has been its use in highway and street paving. When mixed with asphalt, rubber produces paving surfaces which last longer and are free of some of the problems common to asphalt. "Rubber roads are gradually gaining consideration in highway construction," Mr. Wendrow states, "but their rate of use is far below their rate of discard."



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You name the spraying job—small, medium or large. A Hudson power sprayer can tackle it.

Take our 12½-gallon Suburban™ Trail-N-Spray™. Hitch to any compact tractor. Dependable positive piston pump—2½ gpm.

Or step up to our Matador® sprayers. Choice of 3 or 5 gpm positive piston pump. Four tank sizes: 15, 30, 50, 100 gallons.

For really big jobs, choose from our Peerless™ line on wheels or skids—with tanks sizes up to 300 gallons. Can cover turf at 10 acres an hour with 20-ft boom. Or reach up high with telescopic gun mast. Models available with rugged Ten-O-Matic® 10-gpm pump, stainless steel tank for trouble-free service.

Write for details. H. D. Hudson Manufacturing Company, 154 E. Erie St., Chicago, Illinois 60611.

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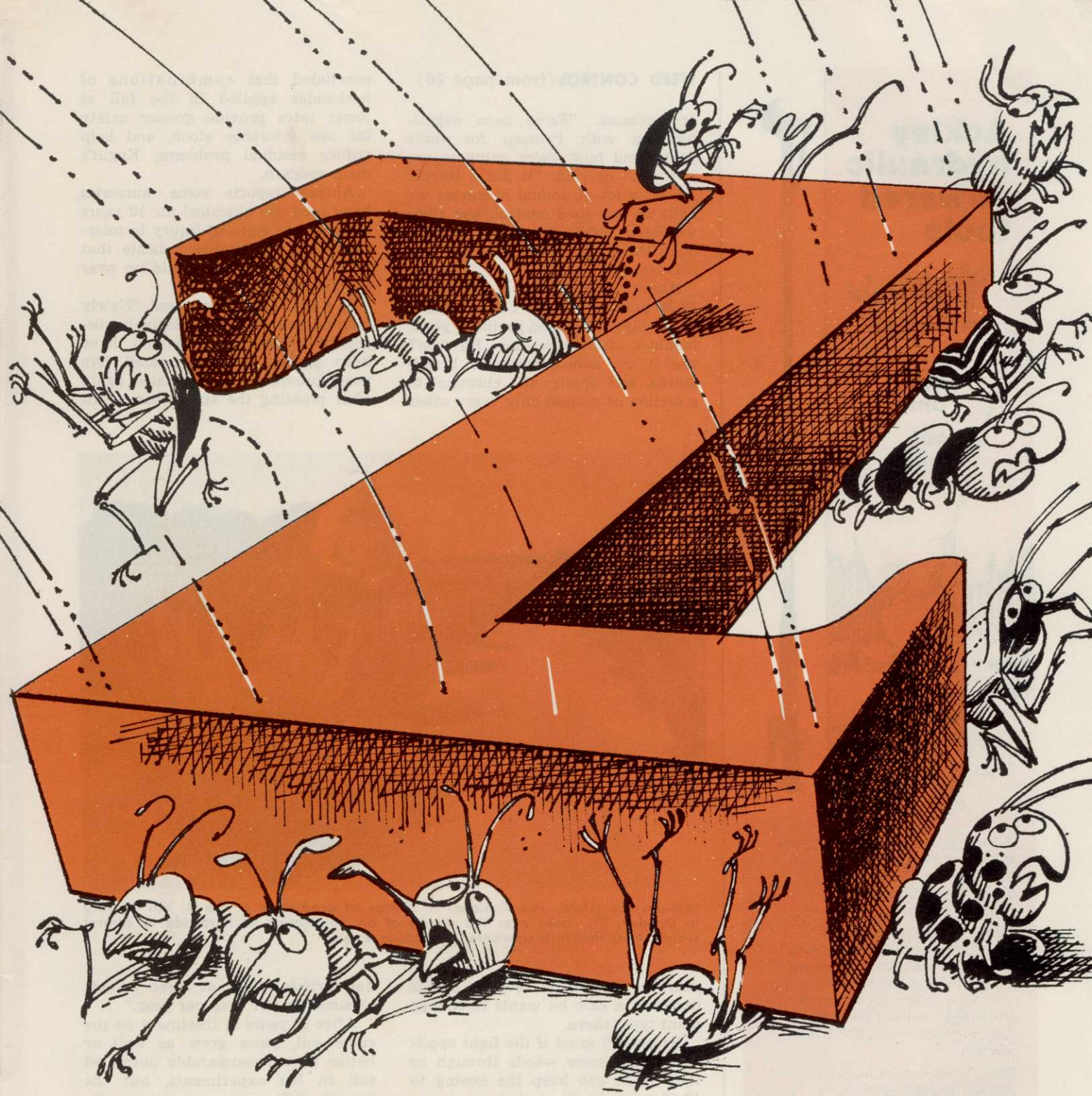

Ag-Organics Department, Midland, Michigan 48640

How to make a lasting impression on bugs. Give them a dose of ZECTRAN* insecticide—the big, powerful, broad-spectrum insect killer. The one that works on almost all major foliage-feeding insect pests—even effective on the hard-to-kill kinds. And it's easily the most versatile. Use ZECTRAN on over 600 different flowers, ground covers, trees, shrubs, house plants and turf. It's biodegradable, non-staining, easy to apply. In liquid or powder. In our formulation, or to mix with yours. Get ready, bugs!

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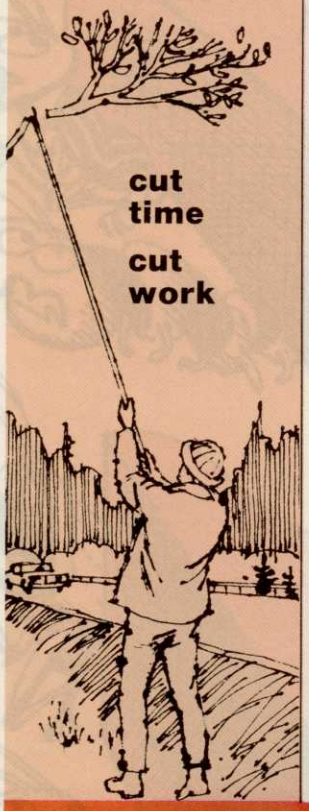

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Ackley tools put you in complete control of big gardening/landscaping jobs. Deliver plenty of power for cutting, clipping, pruning, sawing.

New Ackley Swivel Pruner (illustrated) is designed for fine pruning on new wood or young trees. Gives you the cutting angle you need instantly. Lightweight hook. 360° swivel handle for hard-to-reach areas. 3 to 5 foot lengths.

Need more help? Check with Ackley for pistol-grip chain saws, pole chain saws, pole circle saws and additional pruners. Farm or garden tractor provides the hydraulic power source.

For more information/literature, call Harold DePue, Sales Manager, (503) 659-5660. Or write:

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ACKLEY

For More Details Circle (149) on Reply Card

WEED CONTROL *(from page 26)*

and grasses. "We've been experimenting with Princep for three years, and now we're going to use it more," he said. "It did a terrific job on a lot of annual bluegrass we had; we got good control, and since we keep cultivating all the time, once the early weeds are out, the rest is easy."

Kogut applies the granules at 40-50 pounds an acre ("We're going light with it") around junipers, yews, hemlock, and arborvitae. He won't use it on andromeda and broadleaves, and applies the chemical to a section of ground only every other year. In this way he feels he avoids residues in case he wants to change plant types there.

He doesn't mind if the light application lets some weeds through as long as he can keep the hoeing to 40-50 acres in the spring.

He still feels he's ahead at a cost of $20-25 an acre, including labor. Says Kogut, "chemical weed control saves plenty on hoeing. We get better plant growth and have fewer insects."

August and winter (February and March) applications are normal procedure for the Kogut Nursery. The granules are broadcast with a hand-crank spreader three rows at a time. Frank believes walking it on helps in gauging the wind better and adjusting the fall of the granules.

Having worked in this field since 1958, researcher John Ahrens has concluded that combinations of herbicides applied in the fall at lower rates provide greater safety for low tolerance stock, and help reduce residual problems, Kogut's main concern.

Ahrens reports some nurseries have used the chemical for 10 years without any signs of injury to tolerant stock. His studies indicate that residue levels do not build up over a period of time.

In a 1965 report, he stated, "Newly planted yews and the relatively susceptible Eunonymus sarcoxi have been planted in soil treated five years previously, and treated again after planting the sixth year, without serious injury at three pounds of simazine per acre per year."

William Kreutzfeld, vice-president in charge of production at the D. Hill Nursery in Dundee, Ill., looks over the results of an application of herbicide to control weeds. Note that little unwanted vegetation exists.

After 10 years of treatment on the same soil, yews grew as well or better than a comparable untreated soil in his experiments, but the growth of Eunonymus was markedly depressed. Therefore, he suggests decreasing herbicide dosages as weeds are controlled and alternating and combining herbicides at lower rates to avoid injury to sensitive plants and the building of resistant weeds.

He advocates accurate applications of herbicides, and correct rates of chemical for the results nurseries want.

And those results, for Frank Kogut, at least, are when "a man can walk through 10 acres in an hour, and only hoe what few weeds come up here and there."

For More Details on Preceding Page Circle (133) on Reply Card

Environmental Safety Bulletin Available From Dow

Safety and Loss Prevention Services is the title of the first bulletin in a series on environmental health services published by Dow Chemical Company. The bulletin points up the company's capabilities in developing accident prevention programs aimed at producing a safer working environment for employees and minimizing losses to the employer. For more details circle (722) on the reader reply card.

Encapsulated Chemicals Decrease Human Toxicity

Encapsulation, once the tool of the science-fiction writer, is now being proved as a method of dispersing highly toxic insecticides. Scientists at Pennwalt Corporation's Agchem-Decco Division are encapsulating methyl parathion as well as other insecticides.

Dr. E. E. Ivy of Pennwalt says that test data shows the encapsulated methyl parathion — tradenamed Pencap M — is more than 500 times less toxic by skin absorption and 40 to 100 times less toxic by ingestion than conventional methyl parathion concentrate formulations.

The encapsulation development program was initiated at Pennwalt in an attempt to improve residual performance of methyl parathion and similar products and, at the same time, increase the safety of these products to the user.

The process involves micro-encapsulation of the insecticide in a plastic capsule, 30 to 50 microns up to millimeter size. The rate of release of the capsule contents is correlated with the capsule wall-type and thickness, permitting regulation of release rate from the capsule. This allows a degree of flexibility in designing a capsule for a specific pest control application with a given insecticide.

Dr. Ivy's laboratory and field tests with various Pencap M solutions proved them to be more effective on initial contact, as well as in sustained residual activity, than the emulsifiable concentrates. His tests included such crop and tree pests as bollworms, boll weevils, spider mites, Japanese beetles and gypsy moth larvae.

Pencap M, the first encapsulated pesticide, contains two pounds of methyl parathion per gallon. It may be applied through conventional ground or air spray equipment.

Tests are also underway with encapsulated formulations of parathion, diazinon, malathion and several new experimental insecti-

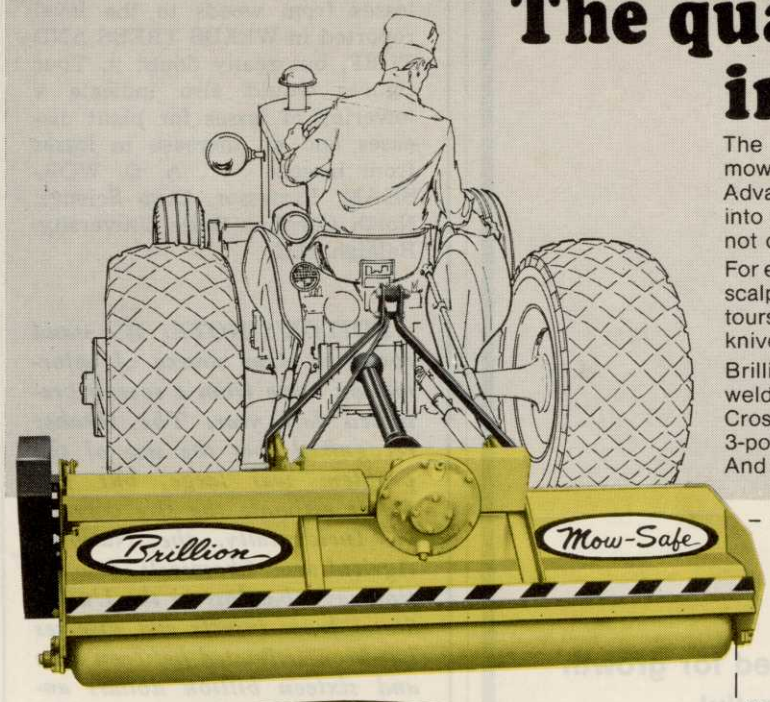
Turf Equipment Firms Sign Marketing Agreement

A reciprocal marketing agreement between a British manufacturer of turf care equipment and Hahn, Inc. of Evansville, Indiana has been reached.

Ransomes Sims & Jefferies Ltd. of Ipswich, England has been appointed the exclusive world-wide marketer for the complete line of Hahn products. The agreement excludes the marketing rights in North America and Japan. Hahn will have exclusive rights for the sale of Ransomes' turf products in the United States.

New 72" Mow-Safe

The quality mower in the 6' class



The new Mow-Safe MS-720 combines safety, precision mowing and maneuverability like nothing else in its class. Advanced Brillion engineering incorporates deflector bar into hood design. Cuttings and debris are deflected down, not out. Protects operator, passersby and buildings.

For even cutting, big 6" diameter roller ends ripples, reduces scalping. Unique float link lets mower follow ground contours. Cutting height adjusts easily from ¾" to 6". Folding flail knives cut clean, swing freely, are easily replaced.

Brillion builds it tough, for long trouble-free life. Frame is all welded. Gear box support unitized with hood weldment. Cross-shaft, drive pulleys and PTO are all shielded. Fits 3-point Category I hitch. Wide choice of options available. And see the 88" Mow-Safe for large-area mowing.

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Please rush information on:

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○ 72" Mow-Safe ○ Landscape Seeders
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○ Turf-Maker Grass Seeder ○ Smooth Roller Pulverizers
○ Name of nearest dealer

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For More Details Circle (132) on Reply Card

PERMISSION GRANTED

Dr. E. B. Himelick, Executive Director of I.S.T.C. (International Shade Tree Conference, Inc.) was particularly impressed with the list of "Don'ts and Do's in Client Relations" by Richard Stemm in the October 1971 issue of WEEDS TREES and TURF. May we have your permission to reproduce this list at some later date in Arborist's News. . . . DR. DAN NEELY, editor, International Shade Tree Conference, Illinois Natural History Survey, Urbana, Ill.

OUR MISTAKE

We at the Weed Science Center of the Crop Science Department of North Carolina State University receive WEEDS TREES AND TURF and enjoy this informative and interesting magazine very much. However, I would like to raise a question about the data given on losses to agriculture from pests in "Trimmings" on page 42 of the January, 1972 issue.

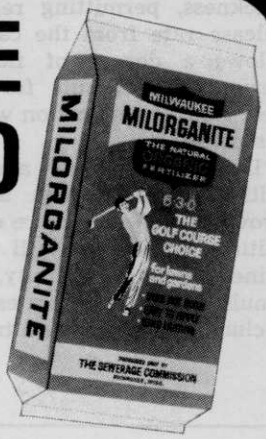
Here it is stated that insects cause an estimated annual loss of $4 billion, plant diseases at $2.7 billion, and weeds at $500 million. In the USDA bulletin, "Losses in Agriculture," 1965, estimated annual losses from insects was $3.3 billion for insects, $3.3 billion for plant diseases, and 2.5 billion for weeds. Adding the cost of controlling these pests, the total figure came to $3.7 billion for insects, $3.4 billion for diseases, and $5.1 billion for weeds.

The USDA, ARS publication 34-23 "A Survey of Extent and Cost of Weed Control and Specific Weed Problems," 1965, states that, "Losses caused by weeds in the United States are believed to equal the combined losses from insects and diseases and to rank second only to those caused by soil erosion. Losses from weeds and costs of controlling them on agricultural lands are estimated to be about $3.8 billion each year."

We would certainly like to think that increased use of herbicides ($509 million dollars worth in 1971) and other weed control practices have reduced losses from weeds to the level reported in WEEDS TREES AND TURF, but really doubt it. Your figures would also indicate a lowering of losses for plant diseases and an increase in losses from insects. . . . A. D. WORSHAM, Professor, Crop Science, North Carolina State University, Raleigh, N.C.

EDITOR'S NOTE: We stand corrected. Our source of information came from a speech presented last year. The speaker recognized that the size of the problem was large, but just didn't estimate the size correctly. Incidentally, the National Agricultural Chemicals Association says that loss in the United States from insects and diseases has been estimated between nine and sixteen billion dollars annually. This represents one-third of the total food bill. Eighty-eight million acres must be cultivated to offset this loss.

WHAT DO WE ADD TO



NOTHING!

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Trees in foreground were stripped of foliage by gypsy moth. Trees in background were treated with microbial insecticide Thuricide.

Biological Control For Gypsy Moth

RESULTS of a major cooperative research program by state, Federal, university and private industry researchers indicate that a biological insecticide can be used to prevent gypsy moth damage to foliage in forests.

Field trials in Pennsylvania and three other northeastern states, coordinated by Dr. Frank Lewis of the U. S. Forest Service, provided field results which may open the way to giving arborists and insecticide applicators an effective alternative to carbamate chemicals for prevention of gypsy moth defoliation

The gypsy moth was responsible for medium to heavy defoliation of more than 1.5 million acres of trees and shrubs last year, but applicators ran into increasing criticism on the use of effective but ecologically questioned chemical pesticides.

Subsequent analysis of field data confirms the efficacy of the biological insecticide. This offers an unusually high degree of safety to all but susceptible leaf-chewing worms. The test results give promise of solving the problem facing the applicator.

"The gypsy moth problem has become so complex that multi-agency, multi-disciplinary approaches are required for an adequate solution," according to one entomologist who has followed the pest's growth in recent years.

Last winter in the face of the pressing demand for a safer, selective, reliable method for controlling the gypsy moth a decision was made to accelerate the field studies needed to document the effectiveness of the biological pesticide called Thuricide.

Impetus for the biological tests was a growing attack against the chemical insecticide (carbaryl) most frequently used in gypsy moth spray programs. Critics had cited potential safety hazards and threats to the environment in opposing spraying chemicals for control of the pest by state and municipal agencies.

At the same time more exotic control approaches such as sex attractants were admitted to require years before achieving commercial status.

As a result chemical spray programs in many communities were delayed or dropped.

Researchers at International Minerals & Chemical Corporaton worked with state, Federal and university scientists to carry out the cooperative field study program. The purpose was to demonstrate that the biological pesticide could afford the combination of effectiveness and safety sought by homeowners, government agencies and conservationists.

IMC recently received Federal registration of its newest, most potent form of the insecticide Thuricide HPC. While it is still too early to determine just how many acres of forests will be treated with the

(continued on page 60)

insect report

TURF INSECTS

CECIDOMYIID

(Asteromyia modesta)

FLORIDA: Adults reared from leaves of daisy fleabane (*Erigeron* sp.) at Miami, Dade County. This is a new county record.

GRASSHOPPERS

NEVADA: Specimens of *Opeia obscura* collected at Alamo, Lincoln County; and *Cordillacris cinerea* collected at Rocky Canyon, Pershing County. These are new county records.

INSECTS OF ORNAMENTALS

WHITEFLY

(Pealius hibisci)

FLORIDA: Specimen collected from cassava in nursery at Samsula, Volusia County. This is a new record for Continental United States. This is a oriental species. Common in Hawaii on hibiscus and gardenia.

TREE INSECTS

SOUTHERN PINE BEETLE

(Dendroctonus frontalis)

LOUISIANA: Outbreak in about 4 million acres. During period September to December 10 million board feet salvaged. Estimated additional 10 million board feet need to be salvaged. Weather hindering salvage operations.

SPRUCE BUD SCALE

(Physokermes piceae)

OREGON: Old scales and crawlers present on Alberta spruce, at Portland nursery, Multnomah County. Presence of crawler stage at this time of year is unusual.

WEEVIL

(Hylobius aliradicis)

FLORIDA: Adult found on floor of house at Astor Park, Lake County. This is a new county record. Feeds on roots of slash pine.

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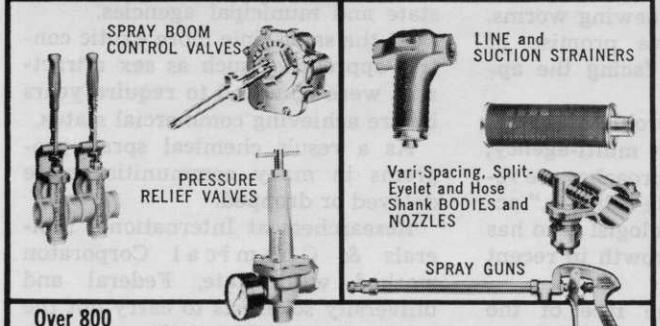

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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Maryland Sod Conference, 7th annual, Center of Adult Education, Univ. of Md., College Park, Md., March 6.

Midwest Turf Conference, Memorial Center, Purdue University, West Lafayette, Ind., March 6-8.

Royal Canadian Golf Association National Turfgrass Conference and Exposition, Skyline Hotel, Toronto, Canada, March 15-17.

Hortus Club, State Univ. of New York Agricultural and Technical College at Alfred, Open House, March 18-19.

Turf and Landscape Institute, Univ. of Calif. Irvine Campus, March 21-22.

Northeastern Aerial Applicators Conference, Ballroom, Statler Inn, Cornell University, Ithaca, N.Y., March 21-23.

Arizona Turfgrass Conference, Stardust Motor Hotel, Yuma, Ariz., April 5-6.

Williamsburg Garden Symposium, Colonial Williamsburg Gardens, Va., Apr. 9-15.

Canadian Chapter of the International Shade Tree Conference, Holiday Inn, Hamilton, Ont., Canada, Apr. 14-15.

Florida Floriculture Short Course and Open House, 18th industry short course, Bradenton, Fla., April 25-27.

Sub-Tropical Turfgrass Trade Show, Deauville Hotel, Miami Beach, Fla., May 7-10.

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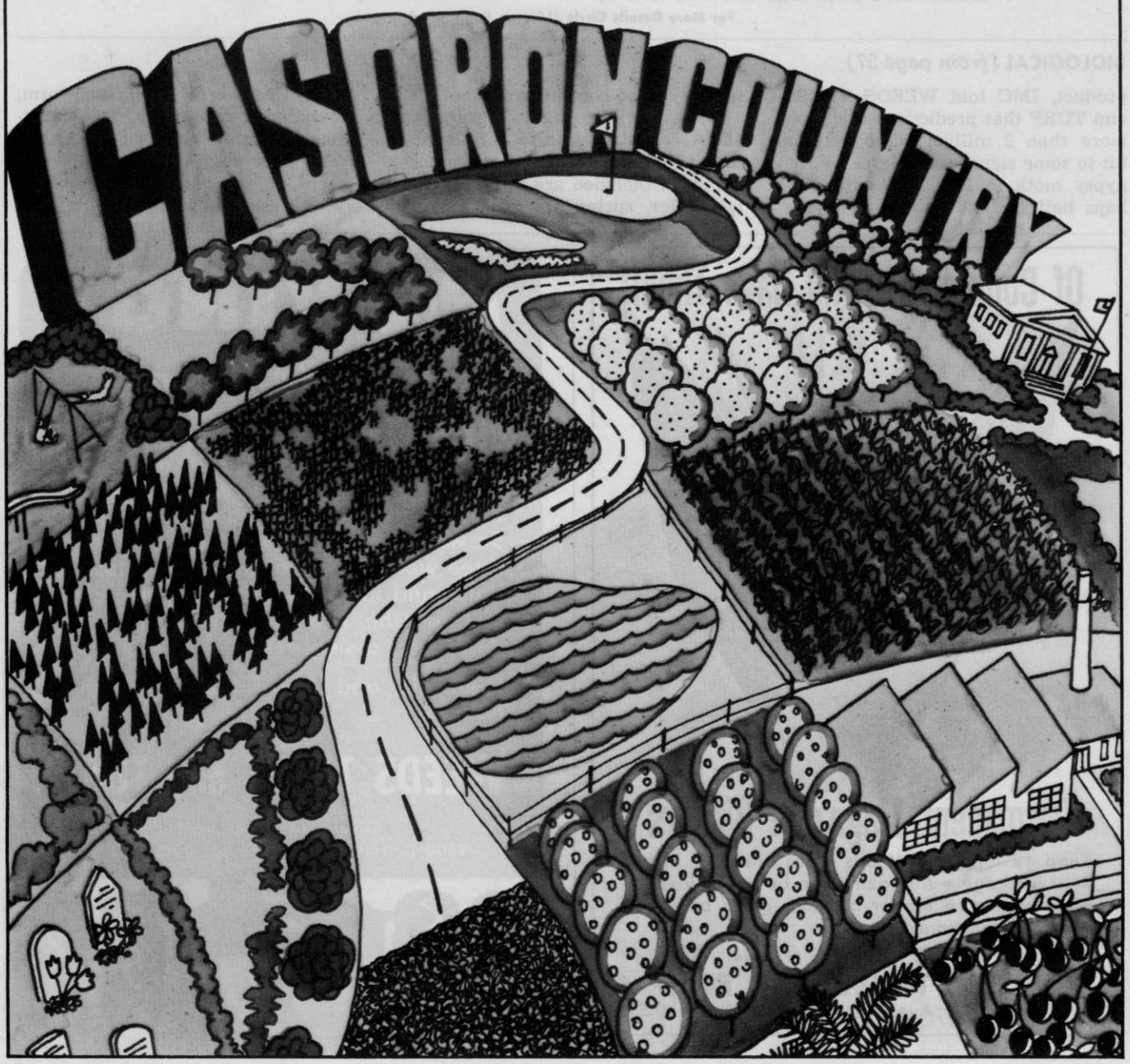

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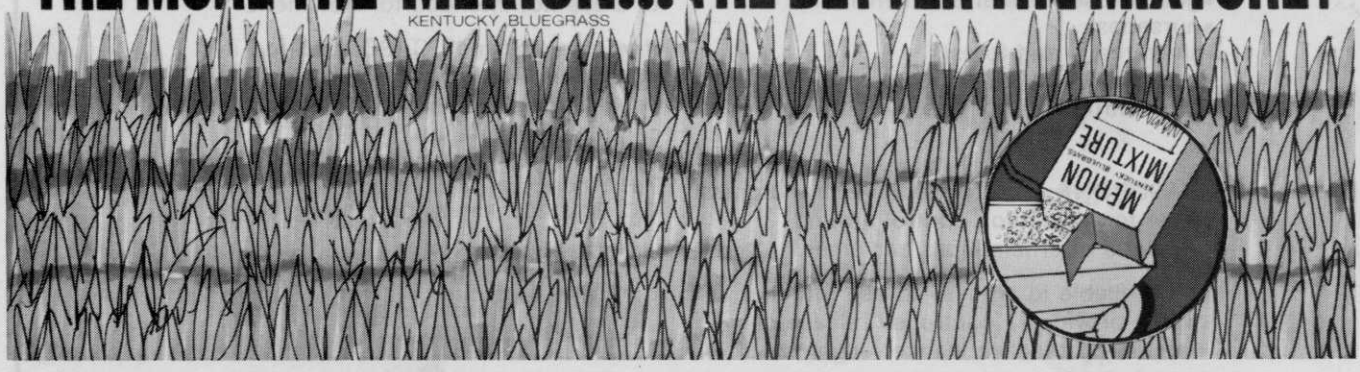

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BIOLOGICAL *(from page 57)*

product, IMC told WEEDS TREES and TURF that predictions are "that more than 2 million acres will be hit to some significant degree by the gypsy moth in 1972 . . . with perhaps half of that acreage receiving some type of control program."

The Environmental Protection (EPA) registration also permits the use of Thuricide on other major forest pests. Included are the fruit tree leaf-roller, spring and fall cankerworm (inchworm), fall webworm, red humped caterpillar, tent caterpiller and California oakmoth larvae.

The first step to testing the efficacy of this biogical compound was a midwinter laboratory test

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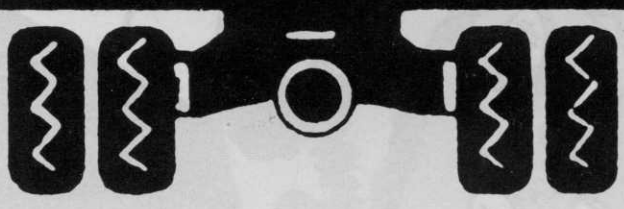

conducted by Normand Dubois of the U.S.D.A. Forest Service at Hamden, Conn.

Dubois simulated aerial spray conditions to demonstrate the potency of the active biological ingredient required to control the gypsy moth.

In this carefully-controled test, the product at the proposed field use rate, 8 Billion International Units per acre, killed 100 percent of the worms.

"Armed with that data, we moved to the next step which was to arrange field tests in three states where the gypsy moth was a leading pest problem" says Dr. Martin Rogoff, manager of microbiology for IMC.

The states involved were New Jersey, Pennsylvania, Connecticut and Massachusetts.

All four states had experienced widespread and severe forest damage from the gypsy moth in 1970 . . . and predictions of even greater infestations were being made for 1971.

The large scale tests of the biological pesticide were successful.

At Burkesville, N. J., trials conducted in replicated plots by William Metterhouse of the state's department of agriculture showed Thuricide HP reduced defoliation of leaves by more than 83 percent . . . indicating a direct correlation between worm kill and foliage protection.

Dr. W. G. Yendol and R. A. Hamlen of Penn State University obtained similar evidence. Foliage protection on treated trees in Berks County (a major gypsy moth area) ranged from 80 to 100 per cent. Worm populations tripled in the untreated control plots during the test period but not in the treated plots.

In Connecicut trials at Hamden and Bethany, Dr. Harry Kaya and Dr. D. M. Dunbar of the state agricultural experimental station at New Haven reported significant worm reduction of two major pests, the gypsy moth and the elm spanworm (which often appears a few days before the more publicized gypsy moth).

At Hamden, reductions of 60 per cent of original populations of both pests was observed in plots tested with Thuricide while worm populations doubled in the untreated plots.

Preliminary results of the Hamden trials led observers to claim a "major breakthrough" in the biological control of the gypsy moth.

Kaya reported "excellent results" against the elm spanworm . . . 95 to 100 per cent control after 14 days.

According to IMC, the effectiveness of Thuricide HPC in its newer form is no longer in question. "We have reached the 100 per cent control mark in repeated laboratory tests. The primary direction of current and future development effort will be to achieve maximum control in large-scale commercial uses and to refine application techniques to insure even more economical and practical use," says an IMC spokesman.

Field tests were performed with ground application equipment, but IMC also carried out independent trials using aerial application techniques to obtain needed data on how the product works under those conditions.

"IMC's aerial application test last summer produced "very good data for future work because foliage coverage was excellent," Dr. Rogoff said.

Dubois also was involved in a test at Whately, Mass., where he worked with Dr. William Becker of the University of Massachusetts. That study, confirming similar replicated trials, resulted in a 62 percent reduction in defoliation.

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Forest Ecologist Studies Herbicides Residues

A professor of forest ecology at Penn State University has determined that herbicides applied to clay soils do a better job of controlling unwanted grasses and broadleaf weeds than when applied to either sandy loam soils or clay loams.

Dr. Robert D. Shipman reports that this may be true because of the higher organic matter and microbial breakdown in the surface layers of sandy loams and clay loams of central Pennsylvania soils.

On soils where poverty grass, Kentucky bluegrass, and timothy are dominant, water movement and herbicide availability is more rapid throughout the entire soil profile on clay soils. However, surface runoff was also greater on the heavier clay soils, Shipman and his associates have demonstrated.

The persistence of residues and lateral movement of 11 soil-applied herbicides was influenced by degree of slope, rate of application, amount of rainfall, kind and extent of vegetation, and the herbicide's ease of dissolving in water.

In studies during the growing seasons of 1969 and 1970, the average distance that 9 herbicides moved through clay soil was 16 feet on an average slope of 7 percent. The longest distance moved was 35 feet on a 7 percent slope, which occurred with Tandex wettable powder. The least flow or drift occurred with a granular mixture of picloram and diuron which moved only 10 feet on a 13 percent slope.

The most effective herbicides for total control of vegetation were bromacil wettable powder, Tandex in granular form, Tandex in wettable powder, and picloram plus diuron mixture.

Eighteen months after application the herbicide bromacil — the most effective of all 11 weed killers tested —showed insignificant residues in clay. The other herbicides left only slight traces after 18 months.

In trials with seedling trees planted on treated plots, the clay soils showed the least herbicidal effect on Japanese larch and hybrid poplars. Both the larches and the poplars survived better on clay soils than on sandy loams and clay loams. Clay and clay loams showed better height growth than the loamy sand sites. Plots treated with diuron showed the best growth in height for both the larches and the poplars.

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WEED CONTROL

trimmings

GYPSY MOTH CATERPILLARS cashed in on Northeastern states woodland areas to the tune of two million acres last year. That's twice the acreage defoliated in 1970, and more than six times the 1969 acreage. About one-quarter of the trees were stripped of from 70 to 100 percent of their leaves. The Department of Agriculture has a comprehensive five-year research and development program underway to bring Gypsy Moth under control. The program makes use of both biological and chemical controls.

WHAT DO YOU DO WITH A SANITARY LANDFILL WHEN IT IS FILLED? Make parks and playgrounds says John J. Roark, director of transportation and project manager for the new Regional Solid Waste Systems Analysis Study and Plan of the North Central Texas Council of Governments. He envisions this idea so practical that he one-day foresees a combined waste Disposal and Parks Board in many U.S. cities.

RESPONSE to a questionnaire sent out by the Minnesota State Department of Agriculture showed that although 29 states have imposed some restriction on pesticide use only five have actually banned (completely outlawed without any qualifications) the use of any pesticide.

SYCAMORE TREES come the closest to being the ideal city tree. They grow to desired heights, tolerate air pollution, salt, bumps from cars and drought, resist diseases, insects, don't clog sewers or crack pavement and they provide shade and a source of beauty. This the conclusion of Frank S. Santamour, Jr., a research geneticist at the National Arboretum. He's been working to develop a super-city tree to withstand the urban life of the 20th Century.

INTERSTATE HIGHWAY SYSTEM costs have now soared to the $76.3 billion mark. That's an increase of $6.4 billion over the estimate of $69.9 billion submitted to Congress in 1970. Using present figures, the 42,500 mile Interstate cost the taxpayer about $1.8 million per mile. Approximately 76 percent of the System is now open to traffic and another 20 percent is under construction or engineering development. When completed, this coast-to-coast network is expected to carry more than 20 percent of all motor vehicle traffic in the U.S.

POLLUTION IN SIBERIA is what the Russians had when they used Kenon Lake near Chita, an Eastern Siberian town, as a coolant for the waters from the Chita Thermoelectric Power Station. The result was a temperature increase of about 10 degrees and an increase in aquatic weeds and grasses. The lake began to turn shallow. Mechanical methods of meeting the problem didn't work. Scientists turned to a biological approach. Vegetation eating fish—white **amur** and fathead—were let loose in the lake, eventually stopping the overgrowth.

AMERICAN INDUSTRIES withdraw more than 17 trillion gallons of water per year from ground and surface sources. Less than one-third are treated to remove pollutants before discharge into public waters.

EPA Registers Dow Herbicide For Texas Use

Tordon 225 Mixture herbicide has been registered by the Environmental Protection Agency for use in Texas to control range brush, according to Dow Chemical U.S.A.

The herbicide formulation is effective in the control of mesquite, a major Texas brush problem.

Tordon 225 Mixture herbicide has been studied in Texas for several years in experimental programs monitored by state and Federal agencies.

Brush experts say the product will give effective control of mesquite, a brush species which destroys the usefulness of millions of acres of range. Brush "polution" is a major economic problem in the Southwest.

Under the label granted by the Environmental Protection Agency, Tordon 225 Mixture herbicide will be applied only by applicators who have been trained in the use of the product and are thoroughly qualified. Applications and results will be monitored to assure that requirements are met and that no environmental problems are caused.

President Richard M. Nixon and James A. Sample, editor of WEEDS TREES and TURF, met in Chicago recently during the annual meeting of the American Agricultural Editors Association. Standing in the background is Joe Elliott, president of AAEA. At a reception in the President's honor, he expressed his optimism about agriculture and his recent appointment of a new Secretary of Agriculture.

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MAINTAIN is the latest improvement in vegetation control. An effective plant growth retardant that will make your grass grow lush and green and very very slowly.

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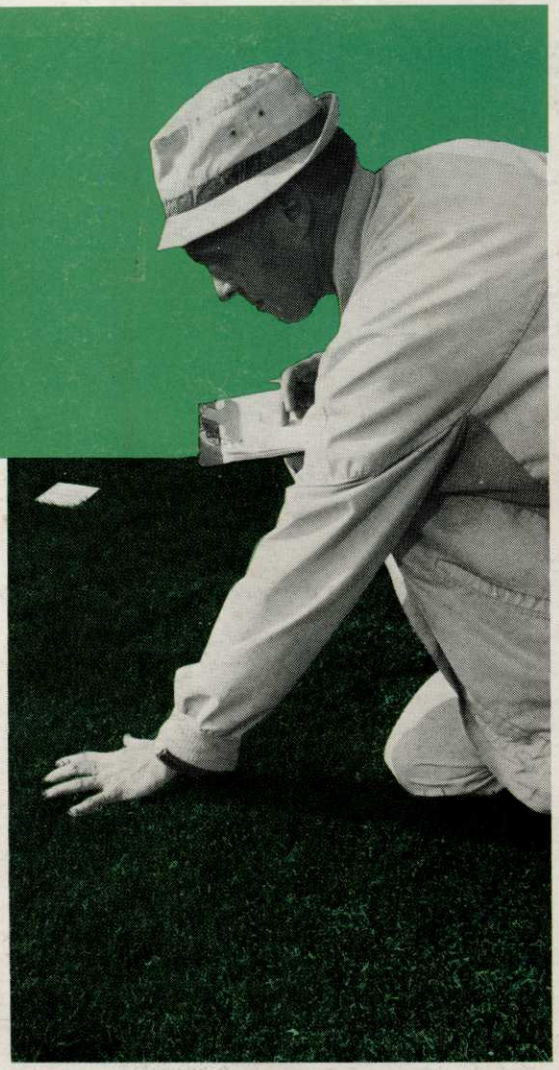

Today, when knowledgeable agronomists talk about The Greening of America, they're talking about Baron Kentucky Bluegrass—discovered in Holland by the renowned plant breeder and seedsman, Barenbrug of Arnhem, The Netherlands, and now grown in America exclusively by Lofts Pedigreed Seed, Inc.

Baron Bluegrass germinates rapidly, grows slowly, and is adapted to mowing as low as ¾″ . . . making it ideal for golf courses, fine lawns, and industrial properties. Its broad blades interlock to make a crisp surface ideal for holding a golf ball on the fairway.

Baron Bluegrass is extremely winter hardy, maintains a fine winter color, and is highly disease resistant.

All Baron seed is CERTIFIED BLUE TAG, poa annua and bentgrass free.

A patent has been issued by the U.S. Federal Government for Baron Kentucky Bluegrass.

Other varieties of grasses currently available from Lofts include Jamestown Red Fescue, Exeter Colonial Bentgrass and Kingstown Velvet Bent.

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Dr. Kenyon T. Payne, Professor of Crop and Soil Sciences at Michigan State University, states: "Baron has been an outstanding variety. It maintains excellent dark green color throughout the season. During an exceptionally severe **Helminthosporium** leafspot infestation in 1970, it ranked second in seasonal appearance of all named bluegrass varieties which are commercially available, and first in this group in resistance to **Typhula** snowmold. It appears to be highly promising for the sod and turf industry." Dr. Payne heads the M.S.U. Turfgrass Breeding Research projects and is currently working on fine-leaf fescue breeding and seed production programs for Wintergreen Chewings Fescue and a new winter-hardy Meadow Fescue.

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